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THE

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OF

DENTAL SCIENCE,

EDITED BY

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ARTICLE I.

Diseased Conditions—Their Effects Upon the Teeth.

Read before the Illinois State Dental Society.

BY G. V. BLACK, JACKSONVILLE, ILL.

Pathological conditions have not been very closely studied in relation to their effects upon the teeth, and we find our knowledge of them somewhat obscure.

A great many writers have seemingly rested their conclusions upon the merest hypotheses, or upon the views of preceding writers, which we are often unable to trace to any specific observations sufficient to render their opinions authoritative.

What is known of the pathological chemistry of the secretions is much scattered in different works, so that it is difficult to collect them, and often their great variance renders the formation of correct conclusions impossible.

On many points, however, we find among the abler zoochemists who have made pathological investigations, a tolerable agreement, and considerable reliable information as to the changes which take place in the secretions.

A number of theories yet exist as to the cause of caries of the teeth. One point, however, we think, may be considered as established, *i. e.*, that the presence of acids is necessary to its inception and progress. We shall, therefore offer no argument on this point, but, for the most part, confine ourselves to those conditions in which acids are introduced into the oral cavity by way of the secretions, using freely what we have obtained from different authors, with our own observations. The extended citation of authors, however, would render our paper too long. Neither can we do more than give prominent features, with here and there some details.

It is well known that the teeth are harder in old age than in youth; that the texture of the teeth becomes firmer as age advances. It has also been noticed repeatedly that the teeth are liable to considerable fluctuation in this respect; that teeth which had previously been noticed to be very firm in texture are afterward observed to be quite soft.

This softening has been noticed more as occurring in pregnancy than in any other condition, and has been attributed to the withdrawal of the lime salts to build up the bones of the fœtus.

It is very generally supposed that the reason for this drain is to be found in the lack of lime salts taken with the food.

I have frequently noticed that the teeth of consumptive patients become very much softened, which I regard as the direct result of the failure of the nutrient functions. A like result is liable to ensue from any failure of nutrition, such as long-continued fevers, or any great depression of the vital powers. Just what changes take place in the constituents of the dentine in these cases is not definitely ascertained, and this point will doubtless be a very difficult one to settle. We are inclined, however, to the opinion that the phosphate of lime is diminished, while the carbonate may be increased. This theory explains more perfectly the universally admitted fact of their being more rapidly destroyed by caries—the carbonate of lime being more soluble than the phosphate.

Much close observation has convinced us that this softened condition contributes but little to the *inception* of caries, but that it allows decay that has become established to progress with greater speed. For the inception of caries, another derangement seems necessary besides the softened condition of the teeth themselves. *Normal saliva* being *alkaline* in reaction, evidently has the effect of neutralizing any acids that may be brought in contact with the teeth. It therefore follows that acids, to effect the solution of the tooth substance, must be in some manner protected from alkaline saliva. This may possibly happen in some positions between the teeth, but such an occurrence seems hardly probable. Neither does it seem probable that the food lodging between the teeth, and decaying, would, while bathed in an alkaline fluid, be able to produce an acid which would affect the solution of the tooth substance. If, however, in connection with such lodgment, an irritation of the gum be produced, and in consequence an acid mucus be poured out into, and around, the decaying food, we have more reason to suppose that an intensely acid condition may arise, and caries be established. If, however, the entire fluids of the mouth be acid in their reaction, as the result of disease or constitutional anomaly, then we can understand how an intensely acid condition may arise in secluded positions about the teeth which favor the lodgment of food, or of the saliva itself—for this substance is liable to speedy decomposition. In such a case we have no neutralizing element, and no check, either as to acid fermentation or its action on the tooth substance, and therefore caries is readily established. When a breach is made in the substance of the tooth, and something of a cavity is formed, presenting only a small opening, and in consequence an almost statical condition of the contents is maintained, it is plain that the very small addition of saliva will only serve as food for acid fermentation, and the caries will continue to progress, although the saliva may have returned to its normal condition of alkalinity. If, however, the acids have only softened a portion

of the substance, and no cavity be formed, or even if the cavity formed have a broad opening, admitting fluids freely, then it usually occurs that the action ceases on the return of the normal quality of the secretions; and the part affected changes to a dark color, forming the spots and so-called "black decays" so often seen in teeth, and so remains, until a renewal of acidity forces the action deeper into the substance of the organ.

If normal saliva is alkaline in reaction, then acidity of this fluid is a diseased condition; and if what we have just said be in anywise true, it is a diseased condition of the utmost importance to the dental surgeon—one which he should labor to understand, and, if possible, to correct.

That the healthy saliva is alkaline, is the opinion of all the great experimenters in zoo-chemistry, among whom we might mention Liebig, Lehmann, Wright, Jacubowitsch, and various others. For five years we have been constantly in the habit of testing the saliva of our patients, and are fully convinced that the views of these men are correct, as applied to our own people. We are not unmindful of the fact that a great many tests have been made, and some reports published, that seem to show that acid saliva was the prevailing condition, to which there was very few exceptions; and for this reason we have been very cautious in our observations, and somewhat slow to publish results.

In making the seemingly simple test of the saliva, very much care is necessary—much more, indeed, than most persons would be likely to admit. In the first place, it is necessary that the test paper should be just right. The color should be uniform throughout, and when dipped into a known neutral fluid, should remain uniform. I have frequently purchased litmus paper that would, when dipped into water, show red spots, or streaks, here and there, over its surface. Such paper will certainly lead to error, and should, therefore, be discarded. The greatest care should be taken to prevent injuring the paper in handling, for it is known that the exhalations from the skin are acid in reac-

tion, and may adhere to the paper in so dry a form as not to color it, but do so quite decidedly upon dipping it into water.

In testing the saliva, any point in the mouth may be selected where the fluid seems most abundant, care being taken not to touch the lips or other parts not thoroughly moistened, otherwise we will be liable to touch mucus that is unmixed with the other secretions, which will often show an acid reaction, when the mixed fluid would be neutral or alkaline. (When we use the term saliva without qualification, we always refer to the mixed fluids of the mouth.) If, when the paper is withdrawn, it shows changes in streaks or spots, it should be thrown aside, and a new test made. There seem to be two reasons for this streaking of the paper, aside from the faulty condition of the paper itself. One is, that the litmus is very readily washed out of the paper by the saliva, and may run in streaks, some parts appearing light and others dark, thereby interfering with the proper reading of the test; or the color may be washed from the paper in such a manner, that the whole surface may appear of a lighter shade, which may also lead to error.

The second cause is from mucus that is unmixed with the saliva, showing a different reaction from the mixed fluid. In ropy conditions of the mucus this is very liable to occur, for the reason that it does not seem to mix with, or dissolve very readily, in the saliva. This feature of ropy mucus renders it comparatively easy to determine its reaction. There is also a difference in the color of the paper when wet and when dry. The best way I know of to learn to read the tests correctly, is to take a vessel of pure water, another with a drop of acid added, and another with a drop of ammonia. Then dip a slip of each of the colors of litmus into the pure water, and lay them on a porcelain slab or a clean white napkin. Dip another into the acid water, and another into the alkaline water, lay them by the first, and note closely the changes. Then add another drop of acid, and one of ammonia, and repeat the operation; and so on until

very decided changes are produced. This should be practiced a great deal by any one who wishes to make close and accurate observations by the use of test paper.

In my tests I have, perhaps, found a small majority of the persons under twenty years of age, who present themselves for dental operations, have exhibited an acid saliva, while those thirty years of age and upwards have shown a considerable preponderance of alkaline saliva. Our examinations of persons outside of our operating room show plainly that our patients present a far larger per cent. of acid saliva than the community in general.

A single examination is in no case a sufficient basis upon which to found an opinion as to the habitual reaction of the buccal fluids, for there are frequently presented considerable fluctuations. Saliva which is habitually acid may become temporarily alkaline, from changes in the food eaten; or that which is habitually alkaline may become temporarily acid, so that frequent examinations are necessary to establish the habitual condition. The saliva also presents a greater degree of alkalinity during digestion than after digestion has ceased, and the stomach is empty.

During my examinations, periods have occurred during which a large majority of those examined presented an acid saliva; other periods have occurred during which the opposite was true. Certain families have presented an acid saliva on all occasions, while individuals have presented an alkaline saliva at every examination.

The greatest proportion of acid saliva has been presented in the time of the prevalence of intermittent fevers, when for one month it amounted to 0.80. The smallest proportion of acid saliva was found during the month of February of this year, when it amounted to 0.23. During this month there was but little sickness, and the few cases were mostly thoracic inflammation.

We have examined the saliva of many persons who had never had a decayed tooth, and of those in whose teeth decay had evidently ceased, leaving a portion of the teeth in

a condition of usefulness. Such persons have almost uniformly presented an alkaline saliva, and those whom we have frequently examined have all shown an habitual alkaline condition.

In cases where decay was evidently progressing rapidly, and was of light color, we have uniformly found the saliva habitually acid in reaction. In those cases where decay is making apparently rather slow progress, and inclined to be of a dark color about the margins and outer strata of the softened portions, we have usually found the saliva nearly neutral, but vascillating between the alkaline and acid reaction. In cases where the decays all present a black color, and this color extends into the still hard dentine, in those cavities with broad openings, we have very generally found the saliva alkaline. In this last condition, those cavities which have very small openings closed by adjoining teeth, often present a lighter color in their interior parts, and are evidently progressing; but those that are black throughout we believe to have become stationary, and will make no progress while the alkaline condition of the saliva remains.

It is not unusual, by any means, to find a number of very dark decays in the mouths of persons somewhat advanced in life, that have made no progress for many years. Then there must be some substantial reason for this cessation of decay. The cause of cessation cannot be found in any change in the structure of the dentine, for it is certainly undeniable that all classes of teeth, the hardest and softest, are liable to decay; not only this, but we have frequently observed it in teeth that had lost their pulps when the decay was progressing—which precludes all possibility of changes in their dentine for the better; then the changes which have suspended the action of decay must be found in the buccal fluids.

The *mucus* is not unfrequently found deranged, while the other secretions present a normal condition These derangements arise, for the most part, from diseased conditions of the membrane secreting it, and have, we think, been more

accurately described by Tomes and Wedl than any other writers. Irritations of the mucus membrane produce acidity of the mucus. Thus, if food lodge between the teeth in such a shape that an irritation of the gum be produced, an acid condition will arise about it on account of the irritated gum throwing out an acid secretion, but if decided inflammation be produced, a serum will be exuded, which is nearly neutral or alkaline in reaction; while, if the inflammation pass to suppuration, and pus be formed, it is always alkaline in reaction. It is therefore, slight irritations of the mucus membrane which induce decay, and not active inflammations.

There is a very ropy tenacious mucus met with in some individuals, which often presents a markedly acid reaction; and is evidently the exciting cause of decay in their teeth. This mucus is occasionally secreted by the entire mucus membrane of the mouth, but we most frequently find it coming from some particular part, as from the gums or the surface covered by a plate for artificial teeth, or other parts. The membrane of the part is usually slightly thickened, and presents a somewhat more reddish color; but frequently by no means distinct; so that if the whole membrane be involved, it could not be detected by these features. It frequently happens that this mucus dissolves very slowly in the other secretions, and is found coating the gums, giving them a peculiar slippery feeling to the fingers when applied to them. This condition is most frequently found confined to the gums on the facial side, and gives rise to decay about the necks of the teeth. We have seen a few cases where it extended entirely around both arches, but it is usually confined to particular portions.

The mucus in usually less strongly alkaline than the saliva indeed a good many writers have given slight acidity as its normal condition; but this we think a wrong conclusion. It is, however, often found acid, when no disease of the mucus membrane is apparent. This may happen when the secretion from the salivary gland is normal, and may be de-

tected by pressing the litmus to the gums when but slightly moistened. We generally find the mucus acid, in connection with acid saliva, and it is frequently difficult to determine without examining the secretions separately, to which secretion the acidity of the mixed fluid belongs. We have occasionally found the mucus alkaline, however, when the other secretions were acid.

A variety of forms of disease are accompanied by an acid condition of the buccal fluids. For information as to these, we are for the most part dependent upon the researches of Lehmann, Wright, Jacubowitsch and others.

I have made many observations myself, with generally the same results. It must be remembered, however, that acid saliva is so common in this country that an observation during sickness is not of much value, unless the previous, or habitual condition is known; a fact which renders many of my observations valueless.

In fever and ague, and those kindred affections known as resulting from miasma, the saliva seems to be uniformly acid in reaction, often markedly so. My own observations seem to show that the saliva may become acid from this cause, while the general system is apparently unaffected; for I have certainly found a much larger proportion of acid saliva when they abounded, than at other times. This class of disease is also accompanied by a species of hyperæsthesia, which is a source of much trouble to the dental operator. The teeth are apt to be unusually sensitive, and the patient so nervous as not to be able to bear the excavation of cavities with any degree of fortitude. It is unusually difficult to make a perfect operation, while the acid saliva searches out every fault to undermine and destroy the work we have accomplished. Teeth are liable to ache, and give trouble, that would not do so in better conditions of the system; and pulps capped are more liable to die.

Continued fevers are usually accompanied by an acid condition of the saliva. The mucus also is usually quite markedly acid. As the fever progresses, the secretion of

saliva from the salivary glands, is partially, sometimes wholly suspended, and the acid mucus dries upon the tongue and teeth, forming sordes, with which the teeth are often coated for a considerable time.

This seems sufficient cause for the increased amount of decay so often observed following continued fevers; especially in young persons, and which is so often attributed to the effects of medicines.

Irritations and inflammations in the course of the alimentary canal are accompanied by an acid saliva. Although their course is usually short, their occurrence is quite frequent, and I have but little doubt that they have much influence in the inception of decay in the teeth of young persons.

Diabetes is always accompanied by an acid saliva, which is usually very marked. Leber and Rottenstein, in their recent work, contend that the acid reaction in this case results from the acetous fermentation in the mouth, of the sugar contained in the saliva in this disease. But Lehmann has drawn the saliva directly from the gland into alcohol, so that such fermentation could not take place, and yet he found it acid.

In irritations and inflammations of the uterus, the saliva is acid, sometimes markedly so. It is also very generally acid during pregnancy, frequently continuing during lactation. We have but little doubt but that this is the true cause of the increased decay of the teeth, which is so marked in pregnant and nursing women. The softened condition of the dentine renders the destructive process more rapid than it would otherwise be.

In dyspepsia there is much disagreement among authors as to the conditions of the secretions of the mouth. We think, however, that two forms of dyspepsia have been confounded, one presenting acidity, and the other the opposite condition of both the oral and gastric fluids; certainly we have found very opposite results in our own observations, both as to the condition of the saliva, and the effects upon

the teeth; some cases showing very acid saliva, and the teeth decaying rapidly, while others show an alkaline saliva, and no decay is manifested.

Consumption is usually accompanied by acid saliva.

In thoracic inflammation there seems to be an increased alkalinity of the buccal fluids. Lehmann has always found them alkaline, while Wright and Jacubowitsch have sometimes found them acid.

In inflammation of the brain and nervous system, the saliva is alkaline.

So far there is a tolerable agreement among chemists who have made pathological investigations; but in most other diseases, the disagreement is so great that no definite conclusions can be formed.

The causes of habitual acidity of the saliva are not as yet understood. It seems to be in some degree an accompaniment of civilization; yet it cannot be a necessary result of our mode of life, as it is by no means universal. Cattle and horses, stall-fed, in close stables, often present it, while those that feed naturally do not. From the fact that we often find it to exist in certain families, every member presenting it, while others present it only occasionally, we are of the opinion that it is an hereditary anomaly, or disease, and that this is the true source of the hereditary nature of caries of the teeth. In all cases where I have found persons of forty or forty-five years of age, with a continuance of habitual acidity of the buccal fluids, without irritations of the mucus membranes, or other visible signs of disease to produce it, I have found their children presented it also.

Habitual acidity is also acquired in some manner where there is no such transmission, and may be of long duration. Many of the cases are, however, temporary in their character, lasting for a few months, weeks, or even only for a few days, and there are, perhaps, very few persons who do not, at some time, present it. The greatest fluctuations are in youth, while in middle and advanced age examinations, from time to time, have shown but very little change.

We cannot now point out any particular quality of food that is certainly known to produce acid saliva without other marks of disease. Some few facts, however, seem to point to common salt as one of its causes. It is understood by our noblest zoo-chemists that a portion of the metallic chlorides are decomposed in the system, in some manner not yet understood. It is supposed that hydrochloric acid is one of the results, as this acid is usually formed upon the decomposition of the metallic chlorides in the presence of moisture. It is in this way that Lehmann and others account for the frequent substitution of hydrochloric acid for the lactic acid of the gastric juice.

A considerable portion of the chloride of sodium taken with the food fails to re-appear in the excretions, and is therefore decomposed. Dalton places the amount thus lost at one-fifth. We have seen persons who, we have no doubt, would consume, in various ways, as much as an ounce of salt per day. A calculation shows that the decomposition of one-fifth of this would produce sixty-grains, by weight, of gaseous hydrochloric acid.

With these facts before us, we have been induced to try some experiments with common salt. Our own saliva being habitually alkaline, and not having shown an acid reaction for several weeks, we commenced taking an additional amount of salt with our food, amounting to about one-third of an ounce per day. For the first few days the saliva showed a somewhat stronger alkaline reaction. On the evening of the third day it was about neutral, and on the fourth day it was distinctly acid. The salt was not taken after the fifth day, but the acid reaction remained for six days. Another experiment was tried with practically the same result. While these theories and experiments are not sufficient to prove that the free use of common salt is one of the causes of acid saliva, they certainly give us good reason to suspect it, and it can be determined by direct and persistent experiment.

Acidity of the saliva is often accompanied by a scarcity of the secretion, and is probably, in some measure, due to a

debilitated condition of the glands; yet in these cases any unusual excitant is apt to induce a superabundant secretion, which, in dental operations, is frequently enormous. In these cases we have generally found the mouth unusually dry, except when there was some special excitement of the glands, and the presence of food fails to excite the usual flow. Even where persons do not complain of dryness of the mouth, an examination reveals but little saliva, so that it often requires some little time to properly moisten a piece of litmus. Such persons are apt to suffer more than usual from thirst. This condition may be in some degree due to the habit of taking liquids while eating, thereby habitually relieving the glands of their natural stimulus of the presence of dry food in the mouth.

The treatment of acid conditions should not be passed without consideration, although nothing very satisfactory can as yet be adduced. Some agents have been found, however, that seem to give some promise of usefulness, although they have not as yet had sufficient trial for us to speak so decidedly of their merits as we could wish.

Acids, administered as medicines or taken with the food, produce increased alkalinity and increased flow of the saliva. Wright found that acids introduced into the stomach of a dog through a gastric fistula also produced this result promptly, and was led to the belief that one office of the saliva was to regulate the amount of acid in the gastric secretions. Experiments with alkalies, however, failed to produce acidity of the saliva; consequently this hypothesis was not maintained.

We have repeatedly found the saliva alkaline a short time after eating oranges and lemons, when it was known to have been habitually acid. But we have not made any very extended trial of the use of acids for the purpose of removing habitual acidity of the oral secretions. It seems, from what we have been able to learn of their action, that their continued use, in large amounts, finally produce opposite effects, in diminished flow of saliva, thirst, dryness of the mouth,

and finally acidity of the secretions. Not unfrequently, however, they produce salivation.

There cannot be much doubt but that the properly guarded use of acids in continued fevers is beneficial to the teeth, as they tend to induce a flow of alkaline saliva, by which sordes is neutralized and washed away.

The remedies we have tried most are black pepper, mustard, and armoracia, or horseradish. Either of these, when partaken of pretty freely as condiments, seem to change the condition of the saliva, when it is acid, quite promptly. Of the three, the armoracia seems to have the most decided action. We know of no valid objection to the use of either of them. They can therefore be alternated, as the tastes of the patient may dictate. I have prescribed them to be taken as freely with the food as the tastes would allow; while salt is avoided as much as possible.

One lady who had, in her two former pregnancies, presented a very acid condition of the secretions, and in each case quite a number of new decays, followed this case with a third. Her saliva was alkaline at the times when I saw her, and no decay made its appearance.

In another case, a lady about twenty-two, unmarried, who suffers much from disease of the uterus, and presents markedly acid saliva and much decay of the teeth, has succeeded in preserving alkaline condition by this course, except at times, when, through sympathy, the stomach is too much deranged to take food. She has pursued this course for about ten weeks.

In most of the cases in which this treatment has been tried, the results have so far been favorable; yet we cannot say whether it will succeed in removing the constitutional anomaly of acidity, so that the remedy can be discontinued, and the alkalinity continue to prevail. If these, or other remedies yet to be found, will bring about this result, we believe caries of the teeth can be controlled with comparative ease. It will, of course, take considerable time to demonstrate satisfactorily the usefulness of any such mode of treatment.

Sialagogues, so far as we have tried them, tend to promote a normal condition of the saliva. The same may be said of the tonic stimulants. Indeed, anything which tends to the promotion of digestion seems to induce alkalinity of the saliva. It seems probable, also, that some of the diuretics may be found useful. Anything which rouses the salivary glands to action seems to induce the elaboration of a normal secretion. Sudden shock, or the endurance of severe pain, as in operations in the mouth, usually induce a temporary change.

We have often noticed that the saliva would be acid before an operation, and alkaline afterward. How much of this may be due to the greater flow of saliva overcoming an acid condition of the mucus, we have not always been able to determine. In many cases, however, where we have examined the parotid saliva separately, we have found a change in that secretion.

The *treatment of acid conditions of the mucus* arising from local irritations is sufficiently clear. All causes of irritation should, of course, be removed, and a healthy condition restored by the usual means. All overlaps of gold or other fillings about the gingival margin of the gum should be scrupulously removed, and the surface made absolutely smooth with that of the surface of the neck of the tooth, so that it cannot act as a mechanical irritant, always remembering that slight irritations are more likely to induce decay than decided inflammations, while the patient is much less likely to notice them.

The *cause of ropy, acid mucus* is not understood. It seems to arise spontaneously, run its course, and cease, after a longer or shorter period. If it continues long the teeth suffer greatly. Those decays caused by it on the facial surfaces of the teeth are very difficult to arrest by filling, as the decay very often reappears by the side of the plug. Indeed, our experience has been that the whole facial surface of the tooth bordering the gum will inevitably be destroyed if this condition remains constant for a considerable period. It is

probably the most difficult form of decay to manage known to the dentist.

We have seen this condition arise and cut grooves across eight or ten teeth, disappear, and the decays turn dark—giving evidence of having become stationary within a few months; and again we have seen it continue for years. Again, it disappears only to return again after a few months, to again disappear and again return. Under my observation, it has but rarely remained constant for a very long period.

The thickened and slightly ingested condition of the membrane indicates the use of astringments in its treatment. We have, however, relied more upon friction in the cases which have come under our care, and have found it very effective in removing it. We direct that the part be thoroughly and strongly rubbed with a quick motion, once or twice per day, either with a rough cloth or a pretty stiff brush.

ARTICLE II.

Taking Upper Impressions of the Mouth.

BY GEO. S. FOUKE, WESTMINSTER, MD.

It is admitted that taking impressions of the mouth, particularly of the upper jaw, for dental purposes, is an operation attended with no little uncertainty as to certain and entirely satisfactory results. Therefore, anything tending to simplify and improve the means of performing this very important operation, will not be lightly esteemed by those engaged in supplying artificial dentures.

We propose to consider the practicability of taking upper impressions after a method based upon scientific principles, and which method when rigidly carried out *must* result in a perfectly successful result. Very little has been done as yet to reduce this operation to a strictly scientific basis. It has been hitherto treated as a purely *art operation*, and as

such it seems to be regarded as an operation dependent entirely upon the skill and experience of the practitioner.

We believe the operation of taking a practically correct impression for an upper denture, is an operation dependent for its successful performance upon *science* more than upon *art;* and it shall be our object to elucidate the fact in this article.

In considering this operation from a stand-point we have thus assumed, we will first inquire, *what is a practically or philosophically correct upper impression?* Is it the *Plaster-of-Paris* impression which the profession now so generally rely upon as the "perfection," *par excellence* of such impression? We say emphatically, no, it is not.

This *plaster* theory of "perfection" would seem to be self-condemned from this consideration alone, namely, that upper dentures made from the most correctly taken plaster impressions, often result in mere approximations to true suction plates, and sometimes terminate in the most disastrous failures.

Plaster impressions of upper cases are only in the main *ideally* "perfect," and may be, for all that is *known* when taken, a very *incorrect* form of impression for the requirements of the case. Now the reason why the ordinary plaster impression as taken for the upper jaw is deceptive and essentially incorrect in many cases, is simply this: *the uncertainty there is in the proper and requisite distribution of pressure against the membranes of the alveolar ridges and the palatine arch.* The whole secret of this matter of what constitutes a scientifically correct upper impression, lies just in this simple proposition, namely, *distribute* the pressure as it should be in taking the impression, and the impression will be practically correct. Such is our experience.

Now that this matter may be better understood, we will consider a moment. It is said that a perfect upper impression consists in this, to wit: "a correct representation of all the parts to be covered by the plate in their *normal condition.*" Plaster has held a long pre-eminence as the *best*

material for taking impressions, mainly for the reason that *pressure* is avoided in the performance of the operation, and the "parts" are not disturbed in their "*normal condition.*

Fatal error! What an immensity of perplexing trials has resulted from this fallacious theory! We look back upon our own twenty years of experience with *plaster upper impressions* with a sensibly felt shudder! But *science—truth* has lifted the veil, and our burden is lightened.

Experimentum docet! It teaches what a practically correct upper impression is, and lays it down as a fundamental principle in the science of taking such impression, that an intelligent distribution of pressure over the surfaces of the ridge and arch of the mouth are an absolute pre-requisite to absolute certainty of practical result. We have exhausted experiment in our own practice, and we feel entirely convinced of the fact, that just in proportion as all the "parts" of the roof of the mouth are perfectly reduced by compression, or intelligently directed manipulative pressure will be the completeness and practical efficiency of the impression. Pressure so applied as to force down all "soft parts" as firmly as possible against the subjacent bones, reduces the entire surfaces to something approximating a uniform, *consistent*, or equally balanced basis or foundation for the resting place of the dental plate. A careful and thorough compression as thus indicated, secures most effectually all that is desirable and necessary in an upper impression. It relieves undue pressure upon the hard *raphæ* of the palatine arch; it sustains the contact of the plate to the "soft" parts; the palatine cavity (so to speak,) is filled by the properly formed plate to its utmost capacity, and as a necessary consequence, the highest degree of usefulness is achieved.

Having endeavored to define what we regard a correct upper impression, we would inquire next *how* is it to be taken in the simplest and most reliable way?

From the nature of the case it is apparent that the ordinary upper impression cups, as made of solid metal, are not

adapted to the taking of the kind of impressions we have described. The cups in use, including even Dr. Thomas Wardle's movable palate plate tray, do not afford the operator the means of directing the necessary pressure against the palate. The pressure as made by the metal cups, is made only in one direction, perpendicular to the apex of the arch, and consequently there is great uncertainty in the distribution of the pressure against the soft sides of the palate. With plaster there is simply no pressure at all; and with wax or gutta-percha, the pressure may be but imperfectly made; especially the lateral compression which is so essentially necessary to a correct impression, it is next to impossible to effect.

Finding it simply impossible to carry out our theory with any trays or cups we could find, we devised the upper impression cup for which letters patent were granted us on the 20th of January, 1874.

It is presumed that the profession are aware somewhat of the nature of our new combination impression cup, and it certainly is no part of our design to speak here of its merits for any personal advantage that may accrue to ourself, but solely for the purpose of promoting the interests of the art and science in which we are engaged.

The cup we have devised is a simple, elegant and sure mode of operating. It allows of direct manipulative pressure to be applied to the soft parts of the roof of the mouth after the ordinary perpendicular pressure has been applied. This after manipulative pressure is made against the flexible bottom of the cup directly with the index finger, and in the most certain manner; leaving no possible uncertainty in regard to the intelligent distribution of the requisite pressure. The cup is suited to the use of plaster, wax or gutta-percha, although we confine ourselves almost exclusively to the use of gutta-percha. Wax is very good, and excellent impressions are taken by this process with it.

The mode of manipulating in the use of our cup is readily suggested by the appearance of the tray; but we have some

peculiarities in our own use of the cup for the different materials, which we regard as important, and which we propose to give in a future recurrence to this subject.

SELECTED ARTICLES.

ARTICLE III.

The Advantages of Capping Pulps of Teeth.

Read before the Seventh District Dental Society at Rochester, N. Y.

BY DR. F. E. HOWARD, GENESEE, N. Y.

It was allotted me this subject, that I might contribute my mite in behalf of the science of Dentistry, and this I most cheerfully do, and if it reflects one spark of light upon this important subject, I shall feel amply repaid for the little time spent in collecting these thoughts together.

About four years ago I made my first attempt upon capping an exposed pulp of a tooth. The subject was a young lady about eighteen, of a scrofula and inflammatory diathesis. The record of the case is as follows:

Miss M. presented herself for examination of the teeth, May 2nd, 1869. Her right lateral superior incisor was badly decayed, the pulp exposed, and bled from excavating. I filled with oxychloride of zinc alone, and dismissed my patient for a future sitting. In a few days she called. During her absence she had suffered considerably from pain in the tooth, and upon examination I determined to remove the filling. I found the pulp in a congested state. I decided to make an application of arsenic and extirpate the pulp. This was done, and the canal filled and the tooth saved by this method of treatment.

My second attempt was no more successful than the first, but this did not discourage me. The third proved a success; for one year after I had capped the exposed pulp in this case, I cut away the chloride of zinc filling and found the pulp alive. It had not in this length of time protected itself by a deposit of secondary dentine. I capped again and inserted a permanent gold filling. One year after the last operation the pulp was alive, and no better result could have been desired.

In this case the patient was of a sanguine lymphatic temperament.

Case 7 was that of a young man eighteen or nineteen years of age, of a sanguine temperament. The tooth was a right superior lateral incisor. The pulp was badly exposed in excavating, for I restored the last portion with a contour filling which was completed at the same sitting. This case comes under my observation often; I made a close examination of the condition of things but a short time ago, and I know that the tooth contains a live pulp that performs its functions with its associates. The case was treated in June, 1870.

Case 10 was that of a young man about eighteen, of a sanguine bilious temperament. The pulp was not exposed so that it bled. I made an application of Hill's stopping to the pulp, and filled with amalgam at the same sitting, and at the present day is a successful operation, after a test of over two years. This case is brought to your notice more particularly to show that success can be obtained with other materials besides oxychloride of zinc, but the latter is much preferred, for reasons that will be spoken of hereafter.

Case 15 was that of a lady forty years of age, of bilious temperament. The tooth was the first right inferior bicuspid. The pulp was badly exposed, and bled from excavating. I looked upon it as being rather a doubtful case. It was a distal approximate cavity, difficult of access on account of the backward inclination of the tooth.

I was not permitted to cut away into the grinding surface of the tooth as much as I should have done if it had been

less sensitive. The pulp was capped with oxychloride of zinc and filled with amalgam immediately.

Two years after, the filling became loose and she presented herself again.

At this sitting the cavity was excavated almost to my entire satisfaction, though normally sensitive.

All of the oxychloride of zinc was removed, and the pulp was beautifully protected by a deposit of secondary dentine.

After properly excavating, the tooth was permanently filled with gold.

Case 20 proved a failure, but I am inclined to think it was because the cap was broken upon introducing the gold, as the zone of the exposure was considerable; being a cavity upon the buccal surface of an under molar, it was difficult of approach and hard to control the flow of saliva.

I took some chance in this case as to what the result would be. I was quite of the opinion that I should not be crowned with success, and I was not; for about one year after I found the pulp dead.

I was, however, successful in capping another pulp for the same patient.

Case 31 was that of a young lady twenty years of age, of a scrofula diathesis. The tooth was the left central superior incisor. This was considerably lopped over the right central, and in excavating I had to necessarily expose the pulp so that it bled. I capped in the usual way and filled with gold.

Eight months after, the filling became loose on account of the cavity not being shaped as I should have had it, were it not for the encroachment upon the pulp to too great an extent. The lady presented herself again, and at this sitting I shaped the cavity quite satisfactorily to myself, without removing all of the oxychloride of zinc, and refilled again. To-day the tooth performs its function as regularly as any of its neighbors. It was first capped February 3rd, 1871.

Case 35 was that of a young man aged twenty-two of bilious temperament. Tooth, first superior molar, proxi-

mate cavity. Capped and filled with amalgam at the same sitting.

Over two years after, decay had occurred, so that it was necessary to remove the filling and refill. I again exposed the pulp, capped as usual, and feel confident of success.

Case 36 was that of a little Miss fourteen years of age, of a sanguine bilious temperament. Tooth, first left superior molar, anterior proximate cavity. The pulp capped as usual and the cavity filled with gold at the same sitting.

A small cavity in the grinding surface presented itself, and should have been filled at the time, but she left town for school. On her return to my office, in one year and a half from that time, the decay had progressed so far that it had caused the destruction of part of the filling alluded to, and I deemed it advisable to remove the whole. The strong septum that divided the two cavities had become so much disorganized that I was compelled to work the two into a compound cavity. In doing this I found the pulp to be in a healthy condition, but the shape of the cavity and the surrounding circumstances prevented me from capping the second time, and I exceedingly regret to say I was obliged to extirpate the pulp and fill the canals.

Case 82 was that of a lady about twenty-two years of age, of nervous bilious temperament. In this case the pulp was exposed in the left superior cuspid. It was found somewhat congested. It was wounded in excavating, and, I think, relieved by it. I medicated with simply creasote for a few days. There seemed to be slight recision of the pulp. In excavating, a small chip got into the cavity or depression, and could not by any means be removed. I thought it would cause trouble by irritation if it was not removed, and I exposed the pulp more on the distal peripheral portion and excised a portion of it and removed at the same time the particle that was retained. I then bathed again with creasote and capped with oxychloride of zinc, and filled temporarily with Hill's stopping for two months. At the expiration of that time I filled permanently with gold. As

yet the pulp remains healthy, after being subjected to this treatment over seven months ago.*

This case is noted to show that, though the pulp be accidently injured, it need not necessarily be lost.

Many other interesting cases might have been brought to your notice, but these will suffice to show some of the advantages of this method of treatment.

Gentlemen: These cases have been presented to your notice particularly, for I think they are marked cases of success and failure. During the last four years I have capped ninety-eight exposed pulps. Many of these cases have been capped under unfavorable circumstances, and yet my operations of this kind have been in a large percentage of cases successful.

Half of these cases have come under my observation months after the operation had been performed, and in many instances I have had the gratification of finding them alive and healthy over three years after they had been capped.

Of the cases seen after the operation had been performed, I consider I have only had six die. What the percentage of success will be with the other half is yet to be seen, but I have no reason to expect any worse results. What cause have I to look for a reaction after a month or a year's time? I cannot believe it. No; if bad results follow, I think they must come within a few weeks or months after the operation has been performed.

Allowing failures do occur, I think that a greater percentage of cases are satisfactory both to operator and patient when this method is pursued, than when the pulps are destroyed and the canals filled.

When we can be taught to shoot around a corner and hit the mark, we will be more successful in filling the canals of teeth; for how often do roots present themselves curved a short distance from the apex, that are impossible to fill well. If not filled to the very end, there is a receptacle left for

I have just tested this tooth carefully, and find the pulp still alive and healthy, after being capped sixteen months ago.

the retention of irritating matter, that will scarcely ever fail to do duty in that direction.

These things never developed themselves fully until the tooth had been extracted. I have seen instances where teeth have been filled by careful operation, that have done tolerable good service for years, that occasioned inconvenience at times since the tooth had been treated. Upon extracting such teeth after the patient had refused to endure the annoyance any longer (though trifling, perhaps, I may say,) what developed itself? A root that was curved at such an angle that it could not be filled perfectly. No one was to blame; an unhappy misfortune both for patient and operator.

Gentlemen, these are cases that have come within the observation of us all. They are not isolated cases, and I present them as an offset to failures in capping exposed pulps. I think there is more success with careful manipulation in capping than there is in extirpating and filling canals. No one will deny that if you are crowned with success in the former class of cases, you have done more for your patient than if you had been successful in the latter; for a tooth that performs its entire function is more useful and better able to meet the morbid influences brought to bear against it, than one that is partly devoid of vitality.

The editor of the *Dental Register* says: "It is a fact generally recognized by every dentist of much experience or close observation, that the integrity of the enamel and dentine of pulpless teeth pass away, with, however, varying degrees of rapidity, dependent upon the character of their structure, and their being modified by the original, together with the condition and force of the organizing and developing agencies at the time of their formation."

Usually teeth deprived of their pulp become in a comparatively short time friable, which is clearly shown by the readiness and frequency with which thin portions break away. This is the difficulty that generally follows the operation of filling such teeth.

This impairment of the enamel and dentine occurs because of the deprivation of nutrient supply; and it is not only exhibited in the manner referred to, but also by the increased susceptibility of the tooth substance to the action of decay producing agents.

The teeth vary exceedingly in the character of their structure; they have general features and aspects that are common to all, yet there is to every one an individually which is constituted by variation in structural details. This variation is palpable to the unaided vision in respect to form and size, but is quite as plainly marked in the minute structure under the microscope.

These variations are in the teeth, as in other structures or tissues, the occasion of ever varying susceptibilities, both in living and dead. The organization in some is so thorough, and the dentine and enamel so nearly perfect, as to resist any ordinary decay producing agents that are brought in contact with them, and sometimes to great extent even after devitalization, while in other cases so inferior are these structures that they are scarcely able to maintain their integrity when but slightly and only for a short time exposed to the feeblest decomposing agents, even when possessed of their normal vitality; and with such, devitalization is followed by rapid and utter dissolution.

Now there is an almost infinite variety of predisposition and susceptibilities between the extremes just presented, and the ability to apprehend and understand these conditions and susceptibilities, and in treatment to follow the indication, is an attainment of no mean order, and one that should be sought by every dentist.

The integrity of organized living tissues is maintained by the presence of vital principle, together with the process carried on by it, and as is already intimated, the hold of vitality upon the material part of tissue is exceedingly variable; in some holding a very firm grasp, and in others yielding its tenure at the first approach of danger. These things being true, the conclusion is forced upon us that the

most acute and cultivated perception is requisite for the proper management of the teeth after they are attacked by disease.

Teeth, the pulp of which are destroyed, have no vitality, and receive no nutrition, and in common with all organized structure deprived of vitality, immediately begin to undergo deterioration, and sooner or later suffer entire dissolution.

With the teeth, however, the change may be materially modified by proper management, which consists in maintaining the most favorable conditions of the parts and tissues around about them, and excluding, so far as possible, all injurious agents and protecting the tooth at all points, so far as may be, from all mechanical violence, either in the way of strokes or undue attrition. By attentive observation and thought upon this subject, the educated dentist will not fail to perceive that pulpless teeth require the utmost care for their preservation for any considerable length of time; that the conservation of living is far easier than those devitalized, and that the perservation of pulp of the teeth is a matter of the utmost importance to those who desire to preserve their teeth in the best condition for the longest possible period.

The dentist who endeavors to cap pulp under favorable conditions has two chances of general success to one of extirpating and filling canals; for if you are not successful by the former method you may be by the latter.

It is anything but an easy matter to remove the filling from the canals of teeth, and if you are not successful in filling to the outer extremity of these canals you will hardly ever escape periosteal inflammation or an abscess, and if you are determined to overcome the difficulty you will have to remove the filling in order to remove the exciting cause of the trouble.

Show me the man who has no abscess formed from filling roots, and I will show you one who never had a failure in capping pulps.

If, after a time, you find that the pulp is dead, you need not remove the filling to amend difficulties, for you can

almost always get better access to the canals by making another cavity in direct line with the axis of the tooth, than you can to treat the case from the cavity already filled ; for I will venture to say that in one hundred cases of exposed pulps, ninety of these will be upon proximate surfaces, and this is almost always an unsatisfactory introduction to the pulp canals. If you are not successful in saving the pulp of the tooth, you have hardly ever lost anything by the method of operation, for the approach to the canal in direct line with the axis of the tooth always compensates for the lost tooth structure. If you should be so unfortunate as to have to remove the filling in the third operation, you have gained much in a point of position. We cannot expect to be crowned with success in all cases in either mode of operating. We must look at the general average, and decide for ourselves which is the best treatment in the main, and under the existing circumstances. If you attempt to cap every exposed pulp, you find those diseased as well as healthy. You will not be successful with all, and should not condemn the practice.

I believe a great deal depends upon the manner in manipulating, and the kind of material used.

There certainly is a difference in the appearance and the general characteristics of the different preparations of oxychloride of zinc used for this purpose.

My manner of using this is first to bathe the pulp with creosote. I have used carbolic acid with good success. Then mix the oxychloride of zinc to about the consistency of cream, and with a small piece of spunk cut for the purpose, that can be nicely introduced into the cavity. I take this with plyers and dip into the prepared zinc and carry it directly to the exposed pulp and press very gently. I then take another piece of dry spunk and introduce this into the cavity, to absorb the excess of moisture in the oxychloride of zinc. Apply more oxychloride of zinc in the same manner and absorb the excess of moisture again.

By applying the preparation in this way there is scarcely any surplus of the material to be cut away. I consider only

a thin layer of oxychloride necessary for success. I think that in some cases, where the whole cavity is filled with this material, bad results follow from the excess of hydrochlorate, which has a deleterious influence upon the pulps in some conditions.

By applying a small portion and absorbing the moisture from it, it does not act as so powerful an escharotic as it would otherwise. Any application of medicine to the animal economy must be in the right proportion in order to get the happy effect. An overdose of almost anything will work mischief. Hydro-chlorate of zinc is a powerful escharotic, and we could hardly expect satisfactory results by applying an excess of the acid to such a delicate organ as the pulp of a tooth.

I believe that of all the preparations used, oxychloride of zinc is the best, for it is porous to a certain extent, and if there is an exudation from the pulp it will be taken up by the oxychloride.

I consider that creosote or carbolic acid should always be applied to the pulp before introducing the oxychloride of zinc, for by its affinity for albumen and gelatine the pulp is protected in the form of a pellicle. There is an affinity between hydro-chlorate and the elements of the pulp, but the effect is not so pleasant.

From my experience in the results of this class of cases I can scarcely see how any progressive dentist can stick to the old method exclusively of extirpating pulps and filling canals, for really everything seems to me to be in favor of making an attempt at capping and preserving these useful organs in as perfect a condition as possible.—*Dental Miscellany.*

ARTICLE IV.

An Unexpected Property of Adhesive Gold.

BY THOMAS FLETCHER, ESQ., F. C. S.

Having slowly come to the conclusion that adhesive foil, sponge gold, &c., although easy to work, do not give in all cases thoroughly permanent results, I endeavoured to find

a satisfactory reason why one peculiar character of gold, apparently so good, should with me prove in practice distinctly worse than the old-fashioned foil with little or no adhesiveness.

Amongst other experiments I applied my own tube test to different samples of gold, and the results were so strange and unexpected that I repeated them time after time with the greatest care before I could convince myself that the results were always the same and were not caused by carelessness or oversight in any way.

Taking a strong glass tube, quarter inch bore, three quarters inch long, I partially closed one end with the blowpipe, and in the small hole left, carefully anchored an adhesive gold plug, building it up with the greatest possible care, using in some cases a Snow and Lewis mallet, and in others hand pressure only. After making repeated trials with adhesive foil, sponge, plastic gold, annealed cylinders, and blocks, using every care, I failed totally in making one single plug tight against moisture. Pack as I would, the filling up of the vacant part of the tube with a coloured solution was speedily followed by the penetration of the fluid by capillary action between the glass and the plug.

When I used soft, non-adhesive gold or tin foil there was no difficulty, and every plug was absolutely tight. The plugs of adhesive gold were apparently a perfect fit, showing no inperfections under a powerful magnifying glass, but the unpleasant fact still remained, that not one was tight enough to resist the passage of moisture down its sides, spite of attempts to wedge the plugs by the use of conical points. Whilst testing some samples of amalgam recently, I was surprised to see some plugs which were very perfect in my hands a few minutes before had become suddenly very faulty. After some experiments I found that the heat of my hands had in a few minutes caused sufficient expansion of the glass to allow the coloured solution to pass between the glass and the plug, and that a large plug in a very smooth glass tube could be made quite loose by the heat of the hand alone.

It is possible that the alternate expansion and contraction of a rigid mass of adhesive gold or amalgam may have something considerable to do with the ultimate failure where the plug is large and much exposed to contact with food at different temperatures. This cause of failure would not be likely to exist with non-adhesive foil, wedged in position, as it always will retain a certain amount of elasticity.

The question raised as to adhesive foil and sponge gold by these experiments is one of such importance that it should not be allowed to rest on the conclusions of any one operator, as the manner of working varies so greatly, and it also remains to be seen whether the process of testing in glass tubes is one which will in all cases bear out the practical results in the mouth. The reason glass was chosen is that faults may so readily be seen and the packing can be carried on in a much more perfect manner, whilst the plug and the point of the instrument can be watched closely.

Since writing the above I have attempted to make water-tight plugs of adhesive foil and sponge gold in cavities in ivory with exactly the same results, and still not being satisfied I gave the result of my experience to two of the best operators I know. The reply in each case was, "Oh, I will make a tight plug for you," the remark being accompanied with a "superior" smile which I fully appreciated. Neither of these tight plugs have come to hand as yet, and it is pretty evident that the failure of adhesive gold in my hands is not an exceptional case. I have now tried some seven or eight different forms of adhesive gold with the same results invariably, and have failed with a foil after annealing which made a sound and tight plug before. When soft and adhesive gold are used alternately, the fluid penetrates to the adhesive part only, being unable to penetrate past a layer of soft foil unless carelessly inserted.

I forgot to mention that the plugs in ivory were examined by being sawn through, after being covered with solution for a time and afterwards dried.—*British Journal of Dental Science.*

ARTICLE V.

Improvements in Dentistry.

There was a time when artificial dentures possessed real value. They were mounted upon gold and silver plates, and regarded by the wearer as quite comfortable and serviceable; then, plain plate teeth were used, and mounted on plates that were cut out so as to be simply wide enough to cover the maxillary ridge. Where an entire denture was needed, spiral springs were used to keep the plates firm to the gum.

This work, though good in its day, was somewhat troublesome, both to the dentist and the patient. Wax being used for impressions, the fit, of course, was approximate, and the benefit to the patient about the same way, until custom overcame the difficulty. At a subsequent period, however, improvements were introduced, and with the advent of the air-chamber and gum-teeth, we imagined the advancement complete. Rims on the plates, both swaged and turned down, were added to the general tenure of this work, and block teeth, continuous gum work, and the various methods of soldering to avoid warping, were among the more immediate improvements.

The laboratory, then, became the centre of science in the profession, and our best men emulated each other in raising this branch of the profession to the highest standard of artistic skill. It was science in art, and constituted an era in the profession that should never have been suffered to be superseded. The downfall of this art started with the advent of casting plates from the baser metals, and the use of rubber and other vegetable substances.

The very simplicity of this latter kind of work, and the ease with which it is constructed, drove science out of the laboratory, and reduced the mechanical branch of the profession to the level of a trade or handicraft. So far, therefore, as the improvements in this department are concerned, the progress has been backwards from a scientific stand-point,

and it behooves us all to see to it, that the operative branch through this progression of appliances and new discoveries, does not meet with the same disaster, thus making the last blunder worse than the first. We think we see symptoms of this already in the increase of the use of the baser metals in foils and amalgams, and the various cements and stuffings which are too readily resorted to, where a more complicated or permanent operation should be performed. Is there not some cause here to fear that that nice artistic manipulation of pure gold will be forced to surrender to the overpowering advance of those cheaper materials for filling teeth?

The new mode of operating upon the natural teeth with the appliances now in vogue, leads the mind into a similar channel of thought, with well grounded fears for the future in that department of our specialty.

With the rubber dam, burring engines, and improved patent pluggers of recent date, it does not require much more talent or skill to become a good, even a first-rate operator in filling teeth, than it did several years ago to put up first-class dentures on the rubber base. The most difficult part of the operation to manage is to adjust the rubber dam. When that is properly done, an ordinary individual, with but a low degree of mechanical ingenuity and but partially expert in working gold, can perform very difficult operations and bring them up to what is termed a first-class standard, when the same parties could with difficulty reach mediocrity in the old method of practice.

Here then is a source of solicitude, lest what we now look upon as the highest attainments of skill be lowered both in value and excellence, by comparatively ignorant and irresponsible men.

It is not our purpose to disparage these improvements, or to underrate the operations which are so well performed by scientific men. But is it not apparent that since the profession has been benefitted by those appliances, what may be termed good operators are far more numerous, whilst

earnest, thinking, reading and scientific men are rather on the decline?

But it may be asked, what have we to fear from all this? Why just this. The profession will be literally run down with good superficial operators, who care more for their own pockets than the status of the profession, and it will be dragged down to the level of a common mechanical pursuit. Or, in other words, the mechanical element will be highly cultivated, and the competition arising therefrom, as in the rubber work, will reduce the valuation of such work, the intellectual element will become stagnant, the qualifications of the dentist will be meagre and low and unable to reach the true genius of the profession as a branch of the healing art.

As a profession, we want first-class operators. We also need all the appliances we can get to facilitate our operations; but at the same time we must give heed to and appreciate old and well-tried principles, and thus guard and develop that balancing intellectual power which gives the mind scope and discrimination to comprehend the complications of disease, so as to be able fully to meet every case with a due sense of that responsibility which should characterize a member of an honorable profession.

This, of course, will admit of no cutting away of old principles, or even the old method of practice. But it will call into requisition every element of improvement, and lead men to value more highly those primitive principles which served as stepping-stones to higher and more advanced stages of excellence.

There is a majesty in the moral force of a scientific profession that should be the chief safe-guard to its dignity and usefulness, and that should dictate the rule of action in the case of any man who would excel as a practitioner. This does not consist alone in the superiority of this or that operator's work—his own sense of his own excellence, nor of the amount of "*blowing*" he may be capable of. It is the force and power of the quality of usefulness he may possess,

in rendering himself useful to the public, with a reciprocal appreciation, and without any further effort to please than simply *to perform well a present duty*, rather than that any man should indulge in this preposterous self-laudation.

The dental profession, like the medical profession is an untiring and ceaseless research for *truth*. In every instance where pathological conditions are present, and their locality and extent are determined by symptoms alone, every step and movement made in the diagnosis is a search for the truth. If, therefore, there is a deficiency here, and the individual who adopts our profession is superficial in those principles, no matter how meritorious his mechanical manipulations may be, *he is a quack*, and no amount of good work or self-praise will extricate him from that unenviable position.—*Penn. Journal of Dental Science.*

ARTICLE VI.

Root Filling.

BY C. W. SPALDING, D. D. S.

I commenced the filling of root canals some time in the year 1849. I had read what had been previously published upon the subject, and owing to the large field of conservative surgery which this new method promised to open, I felt a strong desire to acquaint myself with the details of the operation as then practiced by the few who had attempted it up to this date.

About this time Dr. E. I. Dunning, of New York, described to me the mode of filling these canals practiced by himself and also allowed me to examine the instruments used by him. His method, as I now remember it, consisted in cutting a narrow fold of gold foil into small pieces and carrying them one by one into the canal before the end of a suitable instrument. Providing myself with a supply of slender instruments, similar to those used by Dr. D., I returned to Saint Louis and entered upon the work with much

zeal. My operations were frequent and usually successful.

A year or two afterwards, I think in the summer of 1851, the method employed by Dr. F. K. Badger, then of New Orleans, came to my knowledge. This method has already been described on page 19 of current volume of this journal, and, it appears, was first published in 1854. I immediately commenced a series of experiments with a view of ascertaining what method would best succeed in my hands. My first attempts at preparing the compact cones, used by Dr. Badger, was not very successful, yet I did not abandon it. One day, after having rolled a small piece of foil around a small broach, as directed by Dr. B., it occurred to me that it was then in the best possible position to be carried into the root-canal. I accordingly mounted a number of annealed broaches in this manner, and my next operation was performed with much greater facility and satisfaction than any previous one had been. At once I adopted this modification of Dr. Badger's mode. The broaches employed for this purpose must be re-polished or rubbed smooth after annealing, to allow the pointed roll of foil to slide off easily when the broach is withdrawn. If the point of the broach is too sharp it should be clipped and the foil should be closed over it in rolling. At the point the gold may be easily condensed by rotating it against the thumb nail.

In commencing this operation, select a broach of proper size, armed with a mounting of gold of sufficient diameter to fill the extremity of the canal, or as nearly so as possible, and carry this into the canal of the foramen. The broach must now be slowly rotated in the opposite direction, so as to slightly unwind the foil that is in immediate contact with it. It may now be withdrawn, leaving the gold in place. Condense with probe of whalebone or hickory, and proceed to insert another cone of gold by the side of the first, and so on until the canal is filled. The whole may then be driven forward into the canal either by hand pressure or the mallet —I prefer the latter. After trying different weights of foil I gave preference to No. 4. Cutting the sheet into three

or four strips I folded one of these upon itself, making a ribbon say three-tenths of an inch in width. This fold or ribbon was now cut into sections of the length required for the case in hand, and these again divided diagonally, leaving the pieces triangular in shape and of a width and thickness varying with the demands of the case.

In exceptional cases, it is no doubt well to enlarge the canal before filling, but except where the conditions are favorable the liability of forming a shoulder against which the filling is sure to lodge limits this operation to such canals as are straight and of easy access. The orifice of a canal may, however, be usually enlarged with advantage, but the instrument employed for the purpose should terminate in a point.

Canals of too small a calibre to be filled in the manner described above I have usually filled with gold wire. For this purpose I prefer a rather stiff wire, and have found the alloyed gold used in spiral springs to possess the requisite properties. The wire is first reduced to fill the canal as accurately as possible. It is then cut nearly off, of a length that will allow it to project somewhat into the pulp chamber. A little motion will then sever the slight connection remaining, when the plug may be firmly driven by other means. This wire must not be reduced to a point, for in case it reaches the extremity of the root it must be too large to pass beyond the foramen.

I am doubtful of the necessity for filling *very* small canals at all; but it is so quickly done in the manner I have just described that I have always preferred in this class of operations to leave nothing undone that might contribute to success.—*Missouri Dental Journal.*

ARTICLE VII.

Zinci Oxychloridum—Oxychloride of Zinc.

BY JOHN FAIRBANK, ESQ., M. R. C. S.

The points to be observed by the dentist in preparing the oxychloride are—1st. To use the least possible amount of

the chloride of zinc solution, in order that the oxychloride may contain the largest possible quantity of oxide. 2nd. To be careful to obtain a perfect mixture of the two salts.

The tendency of all oxychlorides to dissolve and wear away in the mouth has always engaged the attention of the profession, and various means have been devised for remedying the defect. Crystalline Silicates, such as finely powdered glass and clay, have been used to act mechanically as a protection against the chemical and mechanical influences always at work in the mouth, but with only partial success. Mr. Fletcher, has, however, lately devised a new mode of protection. By a very careful process he endeavors to coat each grain of the oxide with a varnish which is capable of resisting the action of mineral acids; but unfortunately in this case the means which he takes for protecting the grains of the oxide of zinc from the acids of the mouth must also tend to prevent its perfect combination with the zinc chloride, and this conclusion is borne out by the extreme difficulty one experiences in getting the two to combine, and to form a smooth homogeneous paste; and when one does succeed in obtaining this result, it is only after the grains have been so broken up by the spatula as to destroy the good effect that their coating was to have produced. Mr. Fletcher contends, however, and perhaps with justice, that when mixed with proper care the grains of zinc oxide are not broken up, but only split in half, and that thus only one surface, which is amply sufficient for the absorption the chloride of zinc, is exposed, while the other surfaces remain covered by this coating.

Before mentioning the various cases in which oxychloride might be employed with advantage as a filling, I should like to utter a warning note for the benefit of those who begin to use this filling for their patients good, and end by using it simply for their own convenience and to save themselves trouble. They are in a hurry; the cavity is difficult to get at; a gold filling may not succeed; the tooth is tender too, and the patient does not like pain, so a plastic fill-

ing is introduced. Such get into the habit of using it for all difficult cavities, and reserve the gold for the simpler ones; and thus our skill in gold filling never attains perfection, and we have as a consequence many of our countrymen and women actually refusing to consult any but American dentists.

I should like to offer, as an example for us all to follow, that of one of our leading dentists, who, having twice filled a tooth with gold unsuccessfully, still persevered a third time, almost in opposition to his patient's wishes, and finally succeeded in placing a good gold filling in a very difficult cavity. No doubt he lost in a pecuniary sense, for patients were always waiting his pleasure, but the gain to the profession was worth more than the loss of fees.

Osteoplastic fillings may be legitimately used for cavities of large size with exceedingly papery high walls, where it is not advisable to use amalgam, and where you do not wish to cut the wall down; also for cavities where only one high wall remains, the others having broken away; an example of this you frequently get in bicuspid teeth. Also to fill tender and sensitive milk teeth, where you have no reason to suppose that the pulp is seriously affected. It may be used to fill up the lower portion of very deep cavities, such as you sometimes get on the masticating surfaces of molar teeth; in these cases the gold is economized and the pulp protected. But the two most important instances in which the oxychloride may be used are for capping exposed, or very thinly covered pulps; and for filling the pulp cavity and canals of dead teeth.

Oxychloride of zinc should never be used in proximal or buccal cavities, if it is possible to avoid it; neither should it be employed in those cases where the inflammation of the pulp has gone on to suppuration, or to partial or complete devitalization; in such cases the pulp chamber should be at once opened, arsenious acid applied, and the pulp extracted; and I here allow myself to remark that in my own experience, where I have hesitated to adopt this summary

mode of treatment, and have tried to preserve the pulp, to save the patient and myself the inconvenience and pain of extirpating it, I have always found it to be the exception when success has attended my efforts; and even in the successful cases, when periods of extreme depression of vital powers have occurred, such as the later periods of gestation, the period of suckling, and after exhausting diseases, that particular tooth has begun to give trouble, whereas, in those cases where the pulp is removed and the pulp chamber and canals well filled any result short of a complete success is almost impossible.—*British Journal of Dental Science.*

EDITORIAL, ETC.

The Diarrhœa of Teething Children.—Dr. W. H. Day writes as follows to the *British Medical Association*, and which appears in the *Canada Medical Record:*

The treatment of diarrhœa in teething children is apt to be looked at from a one-sided point of view—the quickest way to arrest it. We have diarrhœa, 1, from dental irritation; 2, from indigestion caused by over and under feeding; 3, from atmospheric changes. Then, too, the diarrhœa may be of a simple inflammatory, choleraic, or dysenteric character; each variety demanding a different plan of treatment.

Astringents, as a rule, are to be condemned. The diarrhœa will continue in spite of them, unless other precautions are taken. If the motions contain mucus, and are slimy, and there is a trace of blood, and redness about the anus, chalk mixture and kino will be of no service, nor will bismuth, acids, or oxide of zinc. The diet is primarily at fault in these cases, and undigested food has passed into the bowels. Warmth and complete

rest, with a dose of castor oil, in such cases, is the most appropriate treatment, though the gums may require puncturing, and a grain each of *hydrargyrum cum creta* and Dover's powder may be necessary. Occasionally a quarter grain of calomel, with a grain of Dover's powder, will be found of great value.

Among hospital patients, a large number of cases of diarrhœa are attributable to over-suckling, and suckling by mothers in delicate health. The return of the catamenia is no hindrance to their nursing, or even menorrhagia in a mild or severe form. Remove all children suffering from diarrhœa from the breast, and let them have cow's milk diluted with lime-water, previously warmed, and given in a well-rinsed bottle, and you will cure the diarrhœa.

Many children are reared on Swiss milk, and this will now and then agree far better than cow's milk. Sometimes milk, in any form and however pure, will keep up the diarrhœa, and then cold barley-water, or cold water thickened with isinglass, will be necessary, or thin water arrowroot, to which a few drops of brandy may be added should the child be exhausted. Sometimes a powder containing two or three grains of rhubarb and carbonate of soda, will neutralize the acidity which has resulted from the fermentative products of digestion, and set the little patients right with magical quickness.

If the evacuations are free from mucus and blood, and there is no pain, a mild mixture of sulphate of magnesia and tincture of rhubarb may be prescribed in some cases with advantage. A drop of ipecachuanha wine in plain water, or mucilage and water, has been recommended, and it will often succeed.

Children are liable to diarrhœa in the summer from heat, and the excitement of traveling, and change from healthy country places or the seaside to the contaminated air of a city.

Replantation of Teeth.—From the *London Lancet* we take the following:

"Replantation of teeth for acute and chronic peridontitis was suggested by Mr. Coleman after seeing the same remedy succeed for acute inflammation of the pulp of a lower molar tooth, which had resisted every known kind of treatment. The principal objection urged against replantation of teeth is that if a tooth is

extracted it must necessarily loose its vitality, and therefore the fangs undergo absorption, so that after a time it becomes useless and must be extracted. Supposing the objection to be valid, as absorption is a long process, sometimes extending over years, it will have been a greater gain for a patient to retain his tooth for an indefinite period than to lose it entirely and at once; but it is no more necessary that a tooth, after undergoing extraction and replantation, should lose its vitality than for a long bone to do so after fracture, with stripping back of the periosteum.

The manner of performing the operation is as follows: A tooth which is to be replanted should be carefully extracted, and as little as possible of the surrounding tissues lacerated. It should then, unless the operation be simply for the destruction of the dental pulp, and where the periosteum is healthy, be immersed in some antiseptic fluid, such as diluted carbolic acid or chloride of zinc (the latter from experience being preferred.) The socket should then be swabbed out some half dozen times with a strong solution of the same antiseptic employed. The tooth, if carious, should be plugged and returned to its place. If there is any thickening of periosteum, fibrous growth, sac of abscess, or absorption at extremity of fang, it should be excised before replantation. Should the patient complain of pain arising from the operation, prescribe poppy fomentations, although the pain is rarely more than what is due to the tenderness of parts from laceration of soft tissues after the extraction of the tooth.

Out of twelve cases that Mr. Coleman has operated on within the last four years, nine are successful and three have failed. The failures have but one significance, and that is, teeth to undergo replantation must be selected. In a cachectic patient the chances are against success; when a tooth has lost the support of its fellows on both sides it cannot become firm. Nevertheless the successful cases warrant a further trial of replantation, which would preserve many teeth otherwise sacrificed."

Can a Person be Anæsthetized During Sleep?—The Medical journals are discussing this very important medico-legal question. We take the following from the *Medical and Surgical Reporter and the Pacific Journal:*

"This question is ably discussed, though not conclusively settled, by Professor Dolbeau, in the January number of the *Annales d' Hygiene* The case was that of a young woman who claimed she had been chloroformed during sleep and then violated. Professor Dolbeau performed several experiments, and found that sleeping animals were readily aroused by the presence of even small quantities of chloroform in their immediate vicinity. The cases of three patients are also given, who while sleeping were readily aroused by applying small quantities of chloroform at no great distance from the nostrils. In a second series of experiments made on seven patients, ten drops of chloroform were poured on a napkin folded in four, which was gradually brought to the vicinity of the air-passages, so that all air inspired had traversed it. In all these cases the patients were suddenly aroused from their sleep, some immediately, and one only after the eleventh inspiration.

A third group of cases, consisting of twenty-nine patients, was next experimented upon, furnishing different results. These are given in some detail, but it will suffice to say that it was found that in ten out of the number—that is, in more than a third, complete anæsthesia could be induced without awakening them. Dexterity in the mode of procedure seemed to have something to do with the proportion thus obtained, for this increased progressively with the number of cases experimented upon.

New researches will still be required in order to establish the influence which may be excited on the results by the age of the subjects, their sex, their prior condition of health, personal habits, etc. The purity of the chloroform employed is also a matter of importance. While thus appealing to future researches your reporter, making certain reserves, still feels that he is authorized in drawing a somewhat positive conclusion. Scientifically it is difficult, but often possible, to render persons insensible by means of chloroform who are in a state of natural sleep. Certain precautions, the employment of a very pure article, and great practice, are conditions that favor the success of the attempt. It is probable that certain subjects are absolutely refractory—that is, it is impossible to anæsthetize them, in spite of every precaution that can be taken. Others, on the contrary, and especially young children, easily undergo anæsthesia with-

out being aroused from their sleep by the irritation which the anæsthetic produces in the air passages. Under the criminal aspect it is certain that chloroform administered to sleeping persons may facilitate the perpetration of certain crimes. It is, however, probable that the conditions favorable for anæsthesia will be rarely combined on the occasion of criminal attempt. But before the tribunals the expert should declare that it is possible if not easy, to render a sleeping person sufficiently insensible by chloroform to allow of his becoming the victim of a criminal attempt."

MONTHLY SUMMARY.

Apparent Death—Recognition by Faradization.—Prof. Rosenthal, of Vienna, has recorded an interesting case of trance detected by faradization in a hysterical woman whose death had already been certified by a country practitioner. It had been found that a looking-glass held to the mouth of the woman did not show any moisture, and that melted sealing-wax dropped on the skin caused no reflex movements. Rosenthal, who was accidentally present, found the skin pale and cold, the pupils contracted and insensible to light, the upper and lower extremities relaxed, the heart's impulse and the radial pulse imperceptible. Auscultation, however, showed a feeble, dull, and intermittent sound in the cardiac region. No respiratory murmurs were audible. All the muscles of the face and the extremities responded well to the faradic current. Although the patient had been apparently dead for thirty-two hours, he thereupon informed the relations that she was only in a trance, and recommended that attempts at resuscitation should be perseveringly followed. On the following day he received a telegram saying that the woman awoke spontaneously twelve hours after his visit, and gradually recovered her speech and movements. Four months afterwards the patient called upon him, and informed him that she knew nothing of the commencement of the attack of lethargy in which she had been ; that she had afterwards heard the people about her talk of her death, but had been utterly un-

able to give the slightest sign of life. Two years afterwards she was still alive and tolerably well.—*British Medical Journal.*

Death from Chloroform—Damages.—It will be remembered some months ago a M. Caron took his wife to a dentist at Lille, who, in his presence, gave her chloroform for the purpose of painlessly extracting some teeth, but she died under the influence of the anæsthetic. The dentist was condemned to one month's imprisonment, and a fine of 500 francs (£20) for "homicide through imprudence;" on appeal he was relieved from the sentence of imprisonment. M. Caron, however, brought a further action in the civil court for damages in the name of himself and of his son, a minor. The judgment accepted as proved (from the sentences of the criminal court and the Court of Appeal) the fact of homicide through imprudence, and condemned the dentist to damages of 4,000 francs (£160) divided thus: 1,000 francs to M. Caron, and 3,000 francs to his young son, to be placed in the funds, the whole capital and interest to be handed to him on his majority. In this case Madam Caron had taken chloroform with impunity on a previous occasion, and the husband had by his presence fully authorized its administration on this occasion.—*London Med. Record.*

Treatment of Chloroform Asphyxiation.—Dr. Campbell, of Paris, recommends, in a late number of the *Journal de Therapeutique*, to place persons threatened with death from inhalations of chloroform head downwards and feet upwards for between ten and fifteen minutes. He considers that death arises through syncope due to cerebral anæmia; hence the advantage of inducing an artificial cerebral congestion. The usual efforts at mechanical breathing, excitement of respiratory nerves, the drawing out of the tongue, insufflation into the lungs, etc., may be had recourse to concurrently. Dr. Campbell mentions only one case where this method succeeded; it was suggested by Nélatou during an operation performed at Paris by Marion Sims. It would appear that the late Professor Nélatou was the first surgeon who introduced this practice. The author also thinks that the inverted position tends to drive from the lungs and trachea pent-up vapors of chloroform, which were increasing the asphyxia.—*London Lancet.*

A Little-Studied Cause of Hoarseness.—The hoarseness to which many public speakers become subject is generally regarded as a symptom of some sort of laryngitis. Dr. H. Welsch, in the Bavarian *Intelligentzblatt*, points out, however, another cause which deserves to be borne in mind in treating the generally ob-

stinate cases, and that is, that the defect of the voice occasionally arises from *partial paralysis of the crico-thyroidei* muscles. They are thus disabled from drawing down the thyroid cartilage, and the extension of the vocal cords requisite to distinct phonation is impossible. The glottis assumes a sort of funnel shape. The treatment he recommends is tincture of iodine externally, and faradization of the impaired muscles —*Medical and Surgical Reporter.*

Treatment of Salivation by Atropia.—The patient, a woman of sixty-eight years, had two attacks of apoplexy followed by hemiplegia of the left side. On being admited into Dr. Ebstein's wards [Breslau Hospital] profuse salivation was observed. According to the patient it had begun a month previously. Atropia was administered internally without any effect. On the dose being increased, the quantity of saliva diminished. Atropia [the sulphate] was then injected hypodermically, and after seven minutes the salivation was stopped. On doubling the dose the secretion was arrested for twelve hours. Dr. Ebstein explains the action of the drug through its influence on the permanent irritation of the secretory fibres of the salivary glands.—*Lancet.*

Cancer Cured by Faith.—Dr. Charles Cullis, of Boston, reports the following: " A lady came to me with a cancer in the cheek, which had attained the size of a filbert. It had a very red and angry appearance. After prayer for her healing, she went into the country, when some one remarked, ' E. thinks that faith will cure her, but this is something that will have to be burned out or cut out.' Her friends tried to induce the use of various applications, all of which she firmly refused. She returned home in *eight weeks*, entirely cured. The friends acknowledge that ' faith did do good once.' ".—*Medical Investigator.*

Remedy for Chronic Hoarseness.—An eminent physician of Philadelphia contributes the following: In chronic hoarseness arising from thickening of the vocal chords and adjacent membrane the ammoniated tincture of guaiacum is often a very efficacious remedy. It may be appropriately mixed with equal parts of the syrup of senega, and a teaspoonful of the mixture given two or three times a day.—*Druggists' Circular.*

Administration of Ether.—At the Bellvue Hospital, New York, the administration of potass. bromid. gr. xxx, previous, and the same amount immediately following, or as soon as the patient can conveniently swallow, after the administration of sulphuric ether for the purpose of producing anæsthesia, is now

regularly resorted to. The effect is to prevent the vomiting which so commonly follows the use of the anæsthetic.—*Medical Record.*

The Areca or Betel Nut.—This nut is the best known as a dentifrice, and masticatory, very popular with the Orientals. In Bombay it is said to be used also with good effect as an anthelmintic.

The natives pick it off the tree, and grate it on an ordinary nutmeg grater. About a teaspoonful is administered, after the patient has fasted twelve or fourteen hours, either made up into a bolus with ghee (clarified butter) or floating on milk, the latter being the favorite method. It generally acts (without any other medicine being given) in about an hour after administration, and is efficacious for round as well as tape worms. It is used both for the human subject and dogs, in the same manner and dose.—*Med. and Surg. Reporter.*

Laughter as a Medicine.—A short time since, two individuals were lying in one room, very sick, one with brain fever, and the other with an aggravated case of the mumps. They were so low that watchers were needed every night, and it was thought doubtful if the one sick of fever could recover. A gentleman was engaged to watch over night, his duty being to wake the nurse whenever it became necessary to administer medicine. In the course of the night both watcher and nurse fell asleep. The man with the mumps lay watching the clock, and saw that it was time to give the fever patient his potion. He was unable to speak aloud, or to move any portion of his body except his arms, but, seizing a pillow, he managed to strike the watcher in the face with it Thus suddenly awakened, the watcher sprang from his seat, falling to the floor, and awakened both the nurse and the fever patient. The incident struck the sick man as very ludicrous, and they laughed heartily at it for some fifteen or twenty minutes. When the doctor came in the morning he found his patient vastly improved ; said he never knew so sudden a turn for the better, and now both up and well. Who says laughter is not the best of medicines? And this reminds the writer of another case. A gentleman was suffering from an ulceration in the throat, which at length became so swollen that his life was despaired of. His household came to his bedside to bid him farewell. Each individual shook hands with the dying man, and then went away weeping. Last of all came a pet ape, and shaking the man's hand, went away also with its hands over its eyes. It was so ludicrous a sight that the patient was forced to laugh, and laughed so heartily that the ulcer broke, and his life was saved.—*The Sanitarian for May.*

Hygiene of Dwellings.—Remarkable testimony as to the permeability of the ground, and of the foundations of our houses, has been given by gas emanations into houses which had no gas laid on I know cases where persons were poisoned and killed by gas which had to travel for twenty feet under the street, and then through the foundations, cellar-vaults, and flooring of the ground-floor rooms. As these kinds of accidents happened only in winter, they have been brought forward as a proof that the frozen soil did not allow the gas to escape straight upwards but drove it into the house. I have told you already why I take frozen soil to be not more air-tight than when not frozen.

In such cases the penetration of gas into the houses is facilitated by the current in the ground-air caused by the house.

The house being warmer inside than the external air, acts like a heated chimney on its surroundings, and chiefly on the ground upon which it stands and the air therein, which we will call the ground-air.

The movement of gas through the ground into the house may give no warning that the ground-air is in continual intercourse with our houses, and may become the introducer of many kinds of lodgers. These lodgers may either be found out, or cause injury at once, like gas; or they may, without betraying their presence in any way, become enemies, or associate themselves with other injurious elements, and increase their activity. The evil resulting therefrom continues till the store of these creatures of the ground-air is consumed. Our senses may remain unaware of noxious things which we take in, in one shape or another, through air, water, or food.—*Pettenkoffer, Sanitarian for May.*

Guarana for the Cure of Sick Headache.—By T. P. Caillout, of Lockport, La. MM. Trosseaux and Pidoux, in their *Traitr de Therapeutique et de Matiere Medical,* describe the mode of using the guarana powder in sick headache, and since the year 1861 I have used it with complete success in all patients who have applied to me for relief for the above mentioned malady. I did not use the extract recommended by Prof. Trosseau, but gave the powder in doses of ten to fifteen grains, repeated every two hours, and the patients rarely took three doses before they were relieved. A ten-grain dose taken immediately before the attack always prevented it.

Some of my patients, who suffered every month from sick-headache, were entirely rid of their sufferings for several months, and some for one and two years, after using one or two boxes of the powder, each box containg a dozen packages of ten grains each. I recommended my patients to take a dose (of the guarana) as soon as they felt any symptoms of an attack coming on; during the attack a dose every two or three hours until relieved. *Med. News and Library.*

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ARTICLE I.

Proteplasm—Its Relation to Vitality.

BY H. R. NOEL, M. D., PROFESSOR OF PHYSIOLOGY.

Valedictory Address delivered February 26th, 1874, at Baltimore College of Dental Surgery.

Within the vast area of scientific investigation, there is perhaps no problem more important than the one known as the "mystery of life." By this we do not mean our ordinary daily lives, our occupations, our pleasures, our sorrows, our successes, our failures, but mean the simple abstract, question life; or that which we possess while the lungs, the heart, and the brain perform their offices, but which ceases when any one of this great "tripod" is stopped.

We associate all ideas of life with the throbbing heart, the expanding lungs, and the thinking brain; we always measure the vitality of any member of the human race by the integrity of these organs, and we look for death or cessation of life by their failure.

But there is a different life and there is a different death going on in our bodies; it begins before our birth and ends

after our nominal death, and it is this life and this death underlying the other, measuring and determining the other, which is indeed the great problem to be solved.

To you who have never studied this subject, to you who have never thought of this hidden undercurrent of life, we would address this essay; and use our best endeavor to place in a clear, plain and practical light the knowledge which we professional men think we possess; in other words, we intend giving you a popular lecture upon a professional subject, and we have chosen *life* as the simplest and best as well as most important and most instructive.

You are aware that flowers, grasses, plants, trees, and in fact all varieties of vegetation possess life; you also know that the ox, the horse, the sheep, and other animals which consume these vegetative productions possess life; and we, who eat these animals possess life. So there is something which is common to *plants*, to *animals*, to *man;* did you ever think of it before? Did you ever realize the fact, that you have been so constructed by the author of all being, as to be in certain respects but one whit superior to the flower which blooms in your garden? Certainly it has life and you have life, and most certainly its life and the "underlying life" of which we spoke above, are so nearly allied that to separate them is not in the present state of our knowledge either possible or desirable.

Let us analyze this question of vegetative life, and perhaps we shall thereby learn a useful lesson in regard to the underlying life of human beings; as the two are called by a common name, the analysis of the one may be the solution of the other. In its simplest form this can be done by studying the phenomena in a vegetable cell, for plants, trees, &c., are more or less aggregations of similar parts, and a *cell* bears the same relation to a tree that an individual would bear to a nation. Now, in "cell life," we find in its very lowest forms three elements. 1st. Food and water. 2nd. Light and Heat. 3rd. A worker. The food is carbonic acid, ammonia, &c.; the moisture is the solvent

of the food to a great extent, light and heat are supplied by the sun, and the worker combines them. Here we come upon interesting ground, for if the *worker* combines Carbonic Acid, Ammonia, Water, and heat and light, we would like to know something of the manner in which this is done; possibly it is as follows: the worker takes the carbonic acid, and ammonia decomposes them and re-arranges their elements, the carbon or charcoal is retained, the hydrogen and nitrogen are retained, but the oxygen is thrown off and escapes in the air, if not entirely, at least partially. The carbon, hydrogen and nitrogen thus obtained, give material for increase in size, or growth, as we ordinarily say; but besides these we also find that the earth gives certain elements of a mineral character, or saline character, such as soda, potash, lime, iron, &c. Then we must consider the food of a vegetable cell as being supplied to it from the air and from the earth alike; and as plants are aggregations of cells, and even the very largest of trees have the same structure, we are justified in concluding that the history of a *cell* is the epitome of a tree.

What then is the history of this simple cell? Nothing very obscure you would think, yet it is really at this very point that some of the most delicate of all problems arise. A superficial observation would lead us to conclude that a cell would be the easiest thing imaginable to describe and explain; but this is not true, for the *cell* has *life*, takes food and water, heat and light, grows and develops, and could I tell you the philosophy of the life of this *one cell*, I could solve the mystery of life, and in its solution give the explanation of that strange tie which binds man, animals and plants in one common brotherhood.

We can at least, however, describe the phenomena of this life, and this in itself is worthy of most earnest thought, as from this description we deduce conclusions as to our own lives. This *cell* has life, it takes its food and water, it grows, it develops, but in order that it may take its food and water it requires heat and light, and its growth and devel-

opement depend entirely upon the heat supplied to it. If these be given in large amounts, the growth is rapid; if in small amounts the growth is slow; here we have upon the very dawn of *life*, upon the very threshold of our subject, two conditions of life—(1) *Material*, (2) *Force*. The food and water are material, the light and heat are forces; and another fact also claims our attention: it is that the material in the cell life, is stored up or deposited in the cells, so that the essence of cell life seems to be increase, accumulation, growth. The carbon, hydrogen, nitrogen and salts, are carefully put away in cells, and so rearranged, so recombined, that we no longer recognized them as distinct elements, but we recognize the *group* as a whole, and call it *wood*, woody fibre, oak, hickory, maple, &c.

Philosophers call the "food and water," "the *material* conditions of life;" they call "light and heat," the "*dynamical conditions of life*," or the forces necessary to life, *i. e.*, vegetative life. But you will perceive that these are only the *conditions*; they are not life itself, but merely the conditions which must envelop something else, and it is this something else which vitalizes the conditions and gives us the phenomena of life.

What is this agent which combines in harmonious union material and force, consumes material and force, and gives us a resultant called growth and development? This is indeed a "worker," this is indeed an architect! This little agent constructs a *cell*, and we say the cell has life; it constructs a plant, and we say the plant has life; millions of them join and construct all the cells of an immense tree, and we say "the tree has life;" really this is not strictly true, for the tree only has life in virtue of the presence of these agents, these factory hands, these workers, which have for their sole object and end, the combination of "material and force"—the union of the ponderable with the imponderable. They construct a "*cell*," or a plant, or a tree, as the coral animalculæ constructs coral reefs, or the sponge animalculæ constructs sponges. This agent has received many

names—all, however, suggestive of the one fact, namely, that this is the lowest, the last, and the truly inexplicable origin of vitality; for vitality as seen in plants and animals, is due to the presence of this microscopic agent.

Protoplasm.—Huxley calls it protoplasm; Lionel Beale, the great English physiologist, calls it germinal matter; Chambers, of London, calls it "nuclear matter," and all agree that to this agent is to be attributed all of the phenomena of vitality.

When examined under the microscope, it appears to be a glass bead, a spherical speck of jelly, transparent and capable of motion. It is rarely over one thousandth part of an inch in size, and may be much smaller, and yet this microscopic *atom* is the boundary between the physical and the vital; it, and it alone possesses the mysterious power of seizing the elements Carbon, Hydrogen, Nitrogen and Oxygen, &c., and arranging them in the peculiar combinations known as structures ands tisues; it, and it alone possesses the power of catching the light and heat of the sun, and storing it away as it combines the elements, so that a union of the two is effected which cannot be dissolved save by chemcial decomposition. Here at this microscopic atom, all physical philosophers have been arrested in their analyses of the phenomena; here all of our physiologists find the terminus of the path of investigation, and small as it is, atom of jelly as it seems, microscopically minute, almost infinitely little, it holds within itself the mystery of life, and we have hitherto searched in vain for the solution of the pro blem of its weird influence over matter and over force. It is incessantly active, always working, never idle, always building, or if not building, it is crawling about like a snail or leech; possibly inspecting the premises, and noticing all points requiring repairs. You have myriads of them in your blood, myriads in all the tissues of the body, and shrewd microscopists, as Waller, of England; Cohnheim, of Berlin; Stricker, of Vienna; and Dr. Woodward, of Washington; have taken great pleasure in watching the movements of these agents,

and speak of their movements from blood vessels to tissues, and among tissues, as *migrations*. In fact, we are now—I mean medical men—in a great controversy as to what is the significance of these very migrations.

This minute agent which moves about and even migrates considerable distances, is found in the simplest of simple forms of vegetation; is found in every plant, in every flower, in every tree; is found in every animal, is found in mankind; and wherever found it has the same appearance, the same form, the same size, the same restless activity.

Let me call your attention to a very important fact in regard to this agent, and the fact is this, that wherever found, whether in plant, animal, or man, it has one and the same office; it has but one occupation, *it is a builder*.

I think we can now understand the value of the word life when applied to plants, animals, and to man alike, or the word vitality when similarly applied. Life, which is thus a common heritage, is due entirely to the presence of this agent, and the *constructive* or *building powers* of this agent give us the phenomena which we term *growth* and *development*, whether seen in a stalk of corn, a young tree, or a growing infant; and in each case and in every case, this constructive factor, this worker called protoplasm, builds the structure, be it vegetable, or be it animal.

Another strange fact is found in this relation of the vegetable and animal kingdoms, and it is an intensely interesting one, that the builders or protoplasm taken from a growing plant, or from the tissues of a human being, are apparently identical in form, size, color, and in every possible physical character, so that no one by a simple examination of any given mass of protoplasm could tell whether it should have the power to build a vegetable tissue, or the power to build an animal tissue; it may have only the power to construct a vegetable cell, or it may have the power to construct a cell of our brain, but whether it possesses one or the other can not be determined by any examination of the little agent itself. To all such interrogatories it returns no answer; it

baffles even the most inquisitive microscope, and unless we know its birth-place and home, its special or individual powers are to us a sealed book. And yet in our bodies there are found builders or agents which make only muscle, others which make only nerves, others again are brain builders, and others form our skin, our hair, our nails; but we cannot tell what building powers they have unless we know from what position they were taken, and even then we are liable to make very great mistakes. The mistake may occur from the fact that it is possible that the very builders we have under examination, may not belong in the tissue whence they are taken; they may be out upon a migrating expedition, and having gotten into the blood vessels in a distant part of the body, have been born to this spot in the blood current, and have made a temporary stop before returning home.

From what has been said, you have learned that though we medical men recognize protoplasm as the origin of all vital phenomena connected with growth and development, yet as to the essential nature of protoplasm, as to the inherent powers, and as to why two little agents exactly alike, should have such diverse powers of growth and development, that one shall form bone, the other brain, we are profoundly uninformed. And here the physical philosopher must also stop, for no chemical theories, no theories of physical forces, no theories of electric forces throw one atom of light upon the subject, and we can only say that God in His infinite knowledge has arranged it thus, and placed a barrier beyond which human knowledge has not and probably cannot pass.

But the phenomena of "life," *i. e.*, the observable workings of these agents are open to our investigations, and in this study we have some most instructive acquisitions.

Though vegetable and animal builders are not to be distinguished by their physical characteristics, yet there are certain well marked distinctions in their histories. We find that vegetable protoplasm has the power of combining ele-

ments, such as Carbonic Acid, Ammonia, Water, &c., and forming vegetable tissues, fruits, oils, &c.; but the animal agents have no such power; they cannot make tissue out of "inorganic elements," but must have the organic compounds formed by the vegetable agents; hence the food of the vegetable agents is derived from ultimatee lements and simple chemical compounds, but the food of animal builders must be from organized material, must be from either the vegetable structures, or from animal structures; hence all vitality in animals depends upon a prior vitality in vegetables, and the food or materials with which our own tissues are built, have either directly or in directly come to us through the constructive power of vegetable agents. Do not understand that the work performed by the agents in the two kingdoms is different, for it is not; the work is the same, but the material employed for the work is different; the process in each case is of one construction.

Conditions of Vitality.—As regards the conditions of vitality, we said that material and force were necessary; in other words, food and water, light and heat; now the protoplasm assimilates or organizes the food, and thus gets material for construction, growth; but at the same time that the material for growth is placed n its proper position, forces are also caught and placed with this material. We cannot destroy matter, we can only change its form. We cannot destroy force, we can only change *one force into another form of force.*

Now vegetation is indirect ratio to heat and light; then we know that heat and light are stimulants to protoplasm; that they are consumed in growth and development; but as they cannot be destroyed, they have only changed form and re appear now as increased vitality in the workers or building agents; but vegetative force, or protoplasmic force, expends itself in construction; where then and how can we find this force thus expended?

In the language of one of England's great philosophers, ("Grove,") "force is continuous and indestructible." Then

the physical force *heat*, manipulated or correlated by Protoplasm, re-appears as *vital force*, or as vegetative force, but when this vital force has constructed a tree, for example, an oak, where is the force? If it be continuous and indestructible it has not been lost, and may yet be recovered. The C, H, N, O, &c., material conditions of vitality are found in the bark and wood, a special chemical combination of elements, but where are the heat and light? To say that they are correlated into vitality is no escape from the question, for we instantly ask what has become of the vital force? To this problem there is an easy solution, and it is found in the chemical destruction or decomposition of bark and wood.

If we chemically decompose the oak, there is liberated exactly the amount of heat and light which the sun in years has given to the tree; yes, even the very light which shone upon it in infancy, hundreds of years ago, and the heat which stimulated its growth have been retained, and now in its chemical death are returned.

Chemical death of wood, chemical decomposition, whether rapidly or slowly accomplished, whether by burning or by silent and slow decay, liberates or sets free every particle of force which the protoplasm consumed in the primary construction. Not one *iota* of it is lost; it has been only borrowed, and is now in the final settlement of the account re turned in an exact and just equivalent. The very *gas which*, burning before me to-night, throws its light upon our meeting, was borrowed myriads of years ago from the sun, was caught as light by the protoplasm of that age, was stored away with the material wood; by slow changes this wood has become *coal*, as coal we have received it from the earth, and subjecting it to a partial chemical decomposition in our gas factories, have obtained a portable form of *force* in combination with Carbon and Hydrogen, and when we still further decompose this by process of combustion, we liberate light and heat.

The forces light and heat, *active* or *dynamic*, are rendered *passive* or *static* by protoplasm in the chemical com-

bination of vegetable fibre. So a dynamic division of force is changed into a static condition; and this static condition is again changed into a dynamic by chemical dissolutions? Gun powder and nitro-glycerine are instances of a *static* condition of *force*, and yet readily rendered dynamic by chemical change. A tree is but a static condition of force, and whether it falls in the forest and moulders away by piece-meal for years, or whether it be used by us as fire-wood, in each instance the same amount of force is set free, the same amount of light and heat before static are rendered again dynamic.

You will perceive that the protoplasm in consuming material and force for the growth and development of structures has destroyed neither, but has stored up both; we begin to appreciate the indestructibility of matter and continuity of force, and we look now upon this protoplasmic agent, this indefatigable worker or builder, as being in the vegetable kingdom, the admirable and indispensable manipulator of inorganic elements, and the great preserver of the sun's capital of force loaned to the earth, in the currency of light and heat.

ARTICLE II.

The Use of Alcohol in Medical Practice.

BY JOHN MORRIS, M. D., OF BALTIMORE.

A report read before the Medical and Chirurgical Faculty of Maryland.

The medicinal use of Alcohol may be truly said to be the growth of this century, and, as it is charged that the employment under the sanction of the profession has wrought much injury to the public good, we think it is fitting that the matter should be thoroughly investigated. It is also asserted in many quarters, that alcohol is not a necessary means of cure, that it is only an excitant and not directly a life sustaining force, and that as we have so many other remedies at our command equally potent in medicinal power,

and not absolutely injurious in their remote consequences, it would seem to be wise to exclude it as an agent in the cure of disease.

To examine the truth or error of these statements is the purpose of this paper, and to this end we shall investigate the following points:

First—Is alcohol food?

Second—Is alcohol a poison?

Third—Is it absolutely necessary in the treatment of disease?

Fourth—Is the good it works in the cure of disease at all equal to the amount of disease it produces?

Fifth—How far are medical men responsible for its use as a dietetic agent?

Sixth—What can the medical profession do by example and teaching to restrict its use.

In our consideration of these questions, or at least a portion of them, it will be necessary to examine the physiological action and therapeutic effects of alcohol, as well as the pathological changes brought about by its use.

First, then, as to its physiological action. This has been made the subject of the severest investigation in the past few years, in the hands of such well-known men as Parkes, Anstie, Thudicum, Dupre, Richardson, and lately Subbotin. These gentlemen differ very widely in their conclusions.

Whilst Anstie and Dupre claim that no elimination of alcohol takes place from the body, but that it remains in the system as a life-supporting, life-giving force, Parkes, Subbotin and others, as strenously assert that it is in great part eliminated, and what is left is only a source of injury to the organism. A fair judgment based on a careful examination of all the authorities on the subject is, that a certain amount of alcohol is eliminated from the body by the lungs, skin, kidneys, etc., but that a large quantity remains in the system in a state of oxidation. Doctor Anstie, the boldest, most zealous, and perhaps the most logical of the writers who contend that the ingestion of alcohol and its

chemical destruction within the body give rise to useful force, argues that alcohol is a hydro-carbonaceous substance, which can be taken into the organism to the extent of one and a half ounces without exciting morbid phenomena, and that like other hydro-carbonaceous substances taken into the system, it is devoted either to the construction of tissue, or to the generation of force, which will display itself obviously under some one of the modes of motion. On the other hand, Parkes, Subbotin and others, deny this, and believe it plays no part in the formation of tissue. Subbotin says that under the influence of alcohol, metamorphosis of tissue diminishes, the temperature is lowered, there is a smaller amount of carbonic acid excreted, and also a smaller quantity of urea found in the urine. He thinks it acts immediately upon the nervous system, and can only be classed as an excitant. The physiological action of the heavy alcohols has been made the subject of investigation by Dr. Richardson, of London, and his scientific deductions have been received on this question, as on all other matters, as incontrovertible truths. Dr. Richardson found that the difference of action of the alcohols as they ascend in the series, and as the carbon increases, is very marked. The slowness of action, the prolongation of action, step by step, from the lighter to the heavier compounds, is truth as definite as any in physiology. He observes as a singular fact, evidenced in all his experiments, that common ethylic alcohol, while it produces stupor, does not, unless it be long continued, induce tremors or convulsions, while butylic and amylic alcohol directly produced these effects. The tremors, caused by amylic alcohol are most persistent; they are called forth by the smallest excitement, and complete recovery from them, as indicated by return of natural temperature, is not attained even when the alcohol is withdrawn in a shorter interval than three days. The same author has shown that the animal temperature is more determinately reduced by the heavier alcohols, and as they are more frequently used, he supposed them to be the cause of delirium tremens and

the lassitude, depression of spirits, coldness, etc., following a debauch. Dr. Richardson's deductions afford us an explanation of the fact that so few cases of delirium tremens occur in the United States at the present compared with former times.

The whiskey sold in the restaurants and shops, is in nearly every instance rectified and compounded, and contains very little alcohol. The true physiological theory perhaps is, that a certain amount of alcohol is decomposed in the system, but that a larger amount remains locked up in the brain, liver, etc., where it accumulates until it finally produces what is termed chronic alcoholism, that it may for a time, and in some slight degree arrest waste, but that in the end, by its causing the retention of effete matter in the system, it leads to degeneration. This effete matter, the urea, chlorides, etc., is retained owing to a paralysis of the nerves.

The therapeutic action of alcohol has excited an equal amount of discussion, and there exists as great a variety and divergence of opinion concerning it. It is generally conceded, however, that in those cases of acute disease in which it appears to act well, it acts as a depressant; that is, it lowers high temperature, lessens frequency of the pulse, and by arousing a transient strength, tranquilizes those nervous disturbances of the system which accompany a high degree of pyrexia. Yet there are patients who cannot tolerate its use, even in this condition, and to whom its administration is an injury.

A physician of much observation and experience assures us that whenever he discovers it on the breath of a patient suffering from typhoid or other fever, he feels assured that it is not assimilated, and is doing injury. Would this not be a good test in the healthy also? The mode of its action in the pyrexia is not clearly understood; but it is supposed that it owes its influence to an antiseptic power by which it destroys those bodies or organisms which induce a febrile state of the blood. In inflammatory conditions it is supposed to contract the arterioles through its influence on the

sympathetic, and to interfere with the migration of the white corpuscles of the blood. Its action in chronic diseases is as uncertain as the modes of its administration are various and irregular. Debility is the bugbear which a class of practitioners have always before their eyes, and for which they are ever wildly prescribing, and with them alcohol, as an agent, occupies the first rank, not even second to that of iron.

Pathological effects of alcohol. The pathological changes or morbid effects of alcohol next claim our attention. These are best exemplified in the very careful and candid investigations of Dr. Dickinson, St. George's Hospital. His views are based upon an analysis of the post mortem and case books of that hospital for a period of thirty years. This comprised the particulars of the examination of the bodies of one hundred and forty-nine traders in liquors. For comparison there were taken from the same source the same number of examinations of persons otherwise and very variously employed, chosen by rule so as to afford a fair standard.

A comparison of the ages at which each class died, showed that to trade in liquor cost three and a half years of life; the alcoholic trader dying at the age of 36 8-10 years, the ordinary patient at 40 6-8 years, the shortness of life in both patients being adduced to the fact that they were hospital patients. The morbid alterations of the two series were as follows: Passing over the stomach, the changes in which are not always evident through morbid anatomy, it was shown, with regard to the liver, that in the alcoholic series there was a great and unmistakable increase of cirrhosis, which disease was found in twenty-two persons of the alcoholic to eight of the non-alcoholic series, the liability to cirrhosis being thus nearly trebled by alcoholic abuse. Fatty degeneration was also increased. In the lungs pneumonia proved to be rather less frequent with the alcoholic, but empyæmia, as distinguished from simple pleurisy, belonged especially to the alcoholic series.

The next important conclusion related to tubercle, which in every shape was most frequent in the alcoholic traders. As the relation between alcohol and tubercles has been the subject of some difference of opinion, it was shown in detail that under alcohol every kind of disease of the lungs to which the term tubercular could be applied was increased. The increase, however, was greatest where the disease was certified as truly tubercular, by the concurrence of disease of the same kind in other organs. This multiple form of disease affected thirty persons of the alcoholic series, nineteen of the non-alcoholic. Tubercle, including all kinds, affected the lungs in sixty-one persons of the alcoholic to forty-four of the non-alcoholic class. It was further shown, that in each of the following organs, the brain, the liver, the kidneys, the spleen, bowels, mesenteric glands, and peritoneum, tubercle was at least twice as common in the alcoholic as in the non-alcoholic category. The conclusion is inevitable that alcohol engenders tubercle. The brain also in the alcoholic class displayed a remarkable preponderance of inflammatory affections. Strange to say, the kidneys, which are generally supposed to be morbidly susceptible to the influence of alcohol, were found very slightly affected. Dr. Dickinson's general conclusions are thus summed up: Alcohol causes fatty infiltration and fibroid encroachment, it engenders tubercle, encourages suppuration and retards healing; it produces untimely atheroma, invites hemorrhage, and anticipates age.

The most constant fatty change, replacement by oil of the material of epithelial cells and muscular fibres, though probably nearly universal, is most noticeable in the liver, the heart, and the kidneys. The fibroid increase occurs about the vascular channels and superficial investments of the viscera, where it causes atrophy, cirrhosis, and granulation. Of this change the liver has the largest share, the lungs are often similarly but less simply affected, the change being variously complicated with or simulation of tubercle; the kidneys suffer in a more remote degree. Alcohol also

causes vascular deteriorations, which are akin both to the fatty and the fibroid.

Doctor Dickinson's conclusion that alcohol engenders tubercle, is a very singular circumstance in view of the fact that whiskey is the great panacea in modern times for the arrest and cure of tuberculosis.

Having thus briefly examined the physiological and therapeutic action of alcohol and the morbid changes induced by its use, we are prepared to discuss the first four propositions named in the beginning of this paper.

From a careful study of the subject, as well as from our own experience, we are constrained to believe that alcohol possesses very limited powers of alimentation. Indeed, Subbotin maintains that it cannot be regarded in any sense as a food. He terms it a *reiz* or *geniess mittel.* Voit, whilst not entirely agreeing with him as to the mode of action of alcohol, concurs in the opinion that it is an excitant or *reiz mittel.* The experience of all wars since the invasion of Egypt by Vespasian has shown most conclusively the superiority of coffee as a dietetic agent, and its greater powers in enabling men to withstand fatigue and privation.

(TO BE CONTINUED.)

ARTICLE III.

Mechanical Dentistry.

BY WM. O. KULP, DAVENPORT, IOWA.

Read before the Illinois State Dental Society.

This old term, "mechanical dentistry," has in it a tingle of odium to many good men in our profession. I can't blame them for it, for are we not a step in advance to a mechanical trade, and does not the term smack of a trade rather than a department of an educated, scientific profession, as ours claims to be? We, therefore, want those in our societies to feel that they have a much weightier responsibility than they would have were they members of a

"trade union." We would not willingly hear surgeons called "mechanical doctors," or surgical appliances "mechanical medicines," yet it would seem just as elegant as to say the "mechanical dentist," or "mechanical dentistry." The term is not inappropriate in either case, for there is much mechanical skill required in the performance of the various operations in each specialty; still it does not sound professional. I, therefore, propose to christen the department of our profession anew, and call it *artistic dentistry*, instead of mechanical dentistry, believing the term to be more appropriate and professional, and it, therefore, will be more acceptable to the profession. It may give the specialty a new standing in the eyes of professional men, and men employed in it may be stimulated to greater efforts to achieve for their department that higher position of perfection which we all so much long to see it occupy.

The artistic dentist should be by nature endowed with much inventive and imitative ingenuity and patient perseverance. He should be a judge of colors, light and shade, form and size, and should have the acquired knowledge of anatomy, physiology, chemistry, natural philosophy, and enough of surgery and general medicine to be able to treat successfully diseased conditions of the mouth, and extract teeth. Let this be the standard, and our profession will not be borne down by its odious members, and humanity will derive the full benefits of this merciful calling. Then the day for impostors and impositions emanating from our unworthy adherents will cease. There perhaps never was a time in the history of our profession when this department was more in a tumult than it is to-day—beset on all sides with patents, patent medicines, patent instruments, patent appliances, patent bases, etc.—some good, some indifferent, others wholly worthless—humbugs. It would take a fortune of money, and all the time at our command, to "keep the run of," and try all the new things that clamor for admission into our patients' mouths and into our laboratories. A few of the most worthy I will consider, aiming only to open the discussion upon this whole subject.

What are the requirements of the substance upon which to mount artificial teeth? 1 answer briefly:

1st. It should be a substance wholly harmless, therapeutically or chemically, to the wearer.

2nd. It should be impervious to the secretions of the mouth, either in a vitiated or normal condition; also to all chemical agents that are likely to be taken into the mouth, either as food, luxury or medicines.

3rd. It should possess sufficient strength, with the least possible thickness, and at the same time should be malleable or plastic enough to admit of being used in building out the absorbed alveoli to any desired thickness, without becoming too heavy and bunglesome to be worn by the patient with comfort.

4th. It should be the natural color of the gums and vermillion border of the lips; this should be capable of being deepened or lessened, as each case may require, as no two persons have precisely the same colored gums.

5th. It should be cheap, so that the poor can avail themselves of the comforts and necessity of artificial dentures.

This leads us to the inquiry, what have we in the profession to-day that "fills the bill?" Echo answers, what? Is gold plate the substance? It has the first two requirements, but there it ends. In combination with rubber, it has another, and I believe is most entitled to the palm of any material in the profession to-day—except cheapness, when rubber alone is the best of all cheap bases, while its rivals—gutta percha, coralline, piroxyline—are attracting much attention, mainly because of the dark and lowering cloud overhanging the rubber question. They are not equal to the race thus far, for their objections are much more numerous, while their advantages are not worthy of mention. So far as beauty and strength are concerned, Dr. Allen's continuous gum work excels all other substances in the profession. But whoever succeeds in overcoming the few serious objections to the porcelain base, in limited use, will set his name by the side of an Arthur, Atkinson and a Bar-

num, for we have nothing that approximates so nearly to the *ne plus ultra* as does this substance. Who will be the genius? To whom shall we render this honor? Nations will rise up and call the successful one blessed. I do not mention silver and the metal compounds offered to the profession in these days, for I do not consider them fit to be put into our patients' mouths.

SELECTED ARTICLES.

ARTICLE IV.

Contour Fillings.—Has Experience Demonstrated their Practical Value.

BY H. L. SAGE, D. D. S., BRIDGEPORT, CONN.

* * * * The word *contour*, as applied in operative dentistry, may possess different shades of meaning, and should be strictly defined. It is a French Word, and signifies in its original sense, "the outline; the line that bounds, defines or terminates a figure."

Therefore, as relating to a tooth, it would designate the line that defines the shape or bounds the peripheral portion in any individual case—and contour filling, the restoration, by any material in use for the purpose of such, when lost by disease, abrasion or accident; which restoration also includes the bulk or body of the lost portion, or rather the substitution *for* such, of any material which will best answer the purpose.

The sense is restricted, first: to a tooth which, having lost its entire crown, has it restored (in the sense in which the

substitution of one material for another constitutes a restoration) by a substance, which, for most practical purposes, will take the place of the original tooth structure; always supposing that substance to be gold, as being the best material yet discovered or employed for the purpose.

Secondly: to a filling in or restoration of contour of a tooth which, having partially lost its crown, a whole or a portion of the walls of the cavity has been broken down, or rendered so thin and friable as to necessitate the trimming of the borders. This may include a sixteenth, (or less,) an eighth, a quarter, a third, a half, three quarters, or even more of the crown—and may usually include either of the proximal surfaces, partially, the grinding or the cutting edge.

Thirdly: to the filling and restoration of contour of a tooth, bereft of either of its palatine (or lingual) or buccal surface, as the case may be, including also one or both of the proximal—partially or wholly—reference being made more particularly to the bicuspids and molars.

Fourthly: to the substitution of gold for the lost portions of incisor and cuspid teeth, when the same are worn away by occlusion on the palatine surface—a substitution not only to prevent further wear, but maintain perfect antagonism or occlusion.

Fifthly: to the restoration (not to be accurate as to terms) of a class of teeth, as the incisors and canines—perhaps the bicuspids to some extent, though rarely—in which the caries has progressed so far as to involve a considerable amount of the labial surface as well as the proximal and a portion of the palatine—leaving, for instance, only a cylinder of dentine enclosing the pulp, or outwardly only the cutting edge, and a narrow portion of the palatine surface intact.

The latter class is, I imagine, the one most frequently, though erroneously considered as unworthy of an attempt to remedy by filling.

The first designated class—an entire crown of gold built upon a root—will usually include the filling of the latter,

though not always, for cases are presented in which the vitality of the pulp may be maintained and yet sufficient anchorage secured to make the operation feasible and permanent, without necessitating the destruction of the pulp. For example, a gold crown was inserted upon a left superior lateral incisor root for a lady patient, Feb. 21st, 1871. This is in good condition and serviceable, though stability was insured without the aid of screws. Furthermore, the pulp is alive and apparently healthy.

Even this class of work will stand the test of time and wear of mastication, if it is a perfect operation of its kind; and many cases in practice will show that a gold crown, even if built upon a lateral incisor root, inferior or superior, will do good service for years, though secure anchorage upon one of these is more difficult to obtain than is the case with larger teeth.

For instance, the roots of an inferior sixth year molar, left side, with the caries extending to the alveolar process on the posterior proximal portion, were prepared for the reception of a gold crown. After properly adjusting the rubber dam, four and one third dwts. of gold, (light and heavy) six hours of malleting, and five and one-half of preliminary preparation and finishing, sufficed to furnish a substitute for the only absent crown on this side of the mouth, which substitute has been a source of comfort to the individual from that time (three years ago) to this, and is likely to remain so many years longer—at the same time stimulating the antagonizing tooth by keeping it in healthful activity.

A projecting central incisor (superior) which had been broken off ten years, was subjected to treatment and placed in a condition to tolerate a restoration of crown.

A root filling of gold seven lines in length was inserted. An entire gold crown was also built upon the root continuously with the filling in the latter, and the natural projection entirely overcome, thus placing the gold crown regularly in the arch. Artistically, it presented a fine appearance, with a compact, mirror-like surface and perfect resto-

ration of contour, by dint of mallet force and proper shaping and finishing. Three dwts. of gold and nine hours' time, aside from treatment, sufficed to render the tooth efficient. A gold crown anchored in a root canal seven lines in length ought to insure permanence, and doubtless will. Perfect adaptation at the base, firm borders, secure anchorage, a densely impacted filling, etc., will not disappoint such an expectation. Many cases might be cited, but this is unnecessary.

It is not always well to put the highest polish on a highly finished crown, though a very smooth surface is essential. A dead finish may be better, but if the young man requests a high polish, it is well to produce it, and if his companions give him the sobriquet of the "little light house," as was done in the above case, the gold can be rendered less conspicuous by a little labor, *i. e.*, by reducing the luster. Much depends upon the conspicuousness which one naturally gives to the teeth in speaking or laughing.

Where a number of gold crowns are required in the same mouth it is good practice to insert them, as my experience has demonstrated by numerous cases in practice.

The principal objection to a gold crown in the anterior part of the mouth is its conspicuousness or unnatural appearance. But this one disadvantage cannot outweigh the more positive advantages of comfort, cleanliness, efficiency in mastication, ease in articulation, the preservation of the root and its maintenance in a wholesome condition, prevention of absorption of alveolus, and the support which an unimpaired alveolar arch and the retention of the roots therein implanted gives to the adjoining teeth, especially when the fangs are in health, so far as, when dead, they may be, and mounted with serviceable gold crowns—that they may also receive the stimulus which an organ in a state of activity receives from the performance of its functions—more especially when some degree of vitality is maintained—aside from the fact that the natural contour of the features is preserved, which, when lost, artificial substitutes can never fully restore.

Another important consideration is the absence of that annoyance which the wearing of a plate often produces, to say nothing of the positive injury, more or less, to the gums and remaining teeth which it (a partial artificial denture) causes, be it ever so nicely adapted to the mouth, or composed of innocuous materials—producing, as it does, a greater or less degree of irritation or inflammation of the mucous membrane, absorption of the soft and hard tissues, and consequent loosening of the natural organs, and also vitiation of the fluids of the mouth, which, acting upon the teeth, become productive of caries.

These consequences are sometimes dependent upon the wearing of artificial teeth, though in a modified degree in many cases—but when rubber is the material employed, how great is its influence for evil. Rubber has its place, and is useful in many directions in the arts, but as a base for artificial teeth it is more injurious than useful.

When gold is substituted for the lost natural tooth structure, so as to constitute an entire restoration of contour, and the root maintains its vitality, or if dead, is placed in a wholesome condition before proceeding with the operation —such a substitute cannot, so far as all the before mentioned advantages are concerned, be distinguished by the happy possessor from the adjoining teeth.

Did any one ever hear of a patient wishing to be rid of such a tooth, if all the necessary preliminary steps were taken and the operation made as perfect as it is the duty and privilege of an honest and skillful operator to make it? Rarely, if ever.

Pivot teeth, though *looking* natural, are, as *usually* inserted, not durable, but very objectionable and unsatisfactory—far more so than a well-finished gold crown ever is or can be— while the former cannot be adapted to the roots of the large grinding teeth or the two-fanged bicuspids; but with gold restoration can be had, and be made permanent and very useful in mastication.

A pivot tooth does not prevent a root from decaying or becoming abscessed. It is true that the roots of incisors and

canines can be preserved by the insertion of certain expensive kinds of pivot teeth, but somehow patients will rarely bear the expense of procuring them, but will usually be better satisfied to pay a reasonable price for the gold crown, with its one objection—not very conspicuous after all—unnatural appearance. But why sacrifice the advantages pertaining to this class of work to natural appearance?

The appearance is but slightly unnatural, and the gold is usually mostly hidden from view. Teeth discolored by caries present a *natural* appearance, for naturally they decay and if let alone a natural death is the consequence. Such decaying and blackened teeth are annoying, injurious, filthy and offensive both to the eye and to good taste, and many are so far destroyed as to necessitate the gold showing, if they are filled at all properly, it being nearly as conspicuous in many cases as if the entire crown were of this material, even if but one-quarter be restored, or the borders merely protected by overlapping.

Yet who would sacrifice a tooth on this account, or forego the benefit of entire restoration of contour?

Which are preferable, finely finished contour fillings, or cavities with friable, jagged borders, dark-looking, semicircular spots in the crowns of teeth, revealing with every smile the consequences of neglect?

The expression is certainly uninjured by the former, and the natural contour of the lip preserved, while if one or more teeth are lost, a plate with teeth attached will not as fully restore it, but will render the speech less natural, modifying the tone of the voice and preventing that full and free circulation which a full natural dentine insures.

As to certain modifications of the gold crown—a gold crown with a porcelain face for instance—my experience will not warrant an opinion, nor does it enter into the subject under consideration.

A few words on the second class of contour fillings—fillings constituting a partial restoration of contour, in which is involved one and sometimes both proximal surfaces, in

which the walls of the cavity are so broken down, or thin and fragile, as to necessitate trimming them with file or chisel until firm and square borders are secured.

This in the incisors and canines may also involve the cutting edge its entire width, or a fraction of it, or in a bicuspid or molar a whole or a part of the grinding surface. In an incisor, the portion lost by decay and filing and shaping the borders, may represent labio-proximally and palato-proximally a crescent shaped cut, leaving the corner of the cutting-edge intact, or more frequently, it will be necessary to sacrifice this portion and restore with gold. In any case the outline of the cut at the cervical portion will present a curve.

Teeth frequently come to our notice where the trimming cannot be avoided without sacrificing the beauty and permanence of both tooth and contour filling.

When the loss of any portion of the labio-proximal or palato-proximal surface of an incisor or cuspidatus becomes necessary, the border should be at least protected by overlapping with gold, and the same may be said of the bicuspids or molars when the corresponding surfaces of these are involved. But it is better that the restoration should be entire than partial, particularly with the front teeth, for a space between these of any considerable extent not only renders pronunciation more difficult, but mars the appearance; and as to conspicuousness, a partial restoration in these cases is, as before stated, more objectionable than full, showing the gold quite as plainly in the one case as in the other, with loss of contour in the former to mar the symmetry and offend the eye by an indefiniteness of form or shape. A V-shaped space is entirely unnecessary with these teeth, for decay here is not likely to recur if the operation is perfect and the patient pays any attention to cleanliness.

But that some discrimination should be exercised in regard to cases in which contour fillings, so-called, are or are not applicable, is apparent, considered with regard to full and partial restoration. For instance, in the case of very

much crowded bicuspids of a peculiar shape—straight-sided teeth perhaps they may be appropriately designated—teeth as wide, or nearly, across the buccal or palatine (or lingual) surfaces, *i. e.*, from surface to surface proximally, at the cervical portion, as they are at, near or toward the grinding surface, in contradistinction from a tooth with the crown diameter proximally much the shortest at the neck.

One objector says contour fillings afford pockets at the necks of the teeth, and thus from the difficulty of keeping them clean, or because they are not self-cleaning, caries is produced at the base of filling, a result of the lodgment and retention of food and secretions.

But the trouble with these straight or parallel-sided teeth is, that if, when they are much crowded or the jaw is full, they are restored to their original shape, they *do not* afford pockets, and therefore are with difficulty cleansed, and hence are more likely to decay at the base of the filling than teeth with narrow necks.

Again, when a tooth is isolated, or standing a little apart from its neighbor there should be a full restoration of contour when lost, whatever may be the conformation. In teeth with the mesial and distal surfaces in contact the entire length of their crowns, or nearly, entire restoration of contour when lost is not usually advisable, as they are then cleansed with difficulty, if at all, and caries is more or less liable to recur. In such a case, a V-shaped space should be left, only protecting the filed borders by neatly over-lapping with as much gold as will be sufficient for the purpose; and where the insertion of ordinary fillings, or fillings including the proximal and grinding surface becomes necessary in this class of straight-sided and crowded teeth, it is often more conducive to their preservation, especially if they are of poor quality, to cut away enough of the tooth to render it self-cleansing; otherwise the most thorough and expert operator even, will be pained to find, in some cases, and after a few years, a recurrence of caries at the base of a well inserted filling.

In the other class, (long and slim bicuspids with narrow necks) the loss should be made good by full restoration—the sides only touching at a point near the grinding surface as in nature, so that all foreign matter may be easily removed with pick and brush from about the filling at the base, and from between the teeth at the necks. These pockets then are more advantageous than otherwise, for they render the teeth capable of being more easily cleansed; but we all know how difficult this becomes when there is no space between them, and then, as before stated, decay is very likely, sooner or later, to return, especially with the bicuspid teeth, with which more failures occur than with the incisors or canines, by far, or the molars, if we except poorly formed sixth-year.

Aside from these considerations, full restoration of the grinding surface should be made, when the V-shaped space is not imperatively demanded, for the efficiency of a tooth is greatly lessened, and mastication of the food rendered an uncomfortable operation when any considerable portion of the grinding surface of one or more teeth is absent, to say nothing of the irritation of the gums which is often caused by the wedging of food in the space made vacant by the loss of tooth substance by caries or by having been cut away by the advocates of the Arthur system of treatment. But the filling should be cut down and shaped so as to maintain perfect antagonism and not prevent the adjoining teeth from shutting together properly, as well as not to hazard the permanence of the filling and render the tooth in which it is inserted sore from irritation produced by contact of the antagonizing tooth with an unnatural fullness of the restored grinding surface.

But it is not my purpose to enter into details with regard to methods of manipulating.

A well-inserted contour filling can, in many instances perhaps, be subjected to considerable rough usage without injury.

A clergyman received by accident a severe blow on the lip, with such force as to produce a slight indentation in the

face of a well impacted contour filling in the right superior cuspid. This tooth has been dead seventeen years, having, as long ago, received a root-filling but having only a quarter of the crown remaining at the upper portion, full restoration of contour was made four years ago.

But two dwts. of gold and five hours' time sufficed to make good what would be to a clergyman, especially, a serious loss and inconvenience. Neither the filling or the tooth received any injury, nor was the adaptation of the gold to the latter disturbed in the least. The teeth in this mouth are of the finest quality, very hard and dense.

In another case the results were more serious. A lady had a central incisor with a loss by caries of two-thirds of the crown, involving the labio and palato-proximal surface and two-thirds of the width of the cutting edge. Full restoration of contour was made six years ago, including a root filling. The crown received a severe blow from the elbow of a companion, filling the natural portion with numerous fractures, radiating like the spokes of a wheel, and breaking off the golden corner of the cutting edge. Notwithstanding, the mechanical union of the filling with the tooth remained perfect. The tooth was naturally soft and fragile, but the loss was repaired by building on the broken portion, since which time (March 9, 1870) it has remained as before.

Now, by the existence of the labor-saving burring engine, the time in preparing cavities and cutting down or shaping and finishing the palatine and grinding surfaces of fillings, is materially shortened; while by the use of the mallet, handled by an assistant, the gold may be so thoroughly welded and condensed as to render the thin cutting edges of incisors when restored secure against anything but violent blows, as in the cases instanced above.

The first filling of this kind (a partially restored incisor crown) with which any personal experience was had, soon broke down from a want of practice with this specific kind of operative dentistry. But success crowned subsequent efforts, the mallet being used in all cases without exception.

Hard rubber, lead or similar metals, and steel were in turn employed—the latter being finally adopted as being the best and most effectual for the purpose, and the least unpleasant to patients.

But restoration of contour is applicable, not only to the front teeth, but to inferior and superior bicuspids and molars, not excepting in favorable cases, the *dentes sapientæ.*

In regard to the third class—bicuspids requiring a restoration of contour from having lost a palatine (or lingual) or buccal surface, including of necessity some of the proximal—doubts have been entertained and expressed as to the durability of contour fillings in teeth with cavities of this specific class. But here there is as much danger of the remaining buccal or palatine wall of the tooth breaking down in mastication as that the filling will give way—though if the masticating surface is properly shaped and not too full, so that the antagonizing tooth will not act as a wedge, thus forcing and spreading the gold against the remaining natural wall or cusp of the tooth until it is fractured, there is little to apprehend from this source, and the time spent in restoring such teeth to their original shape is well occupied; for the success may be as complete as with any other class of contour fillings, with the chances for permanence also, nearly as great, provided all the essential details which belong to thorough and skillful operating are complied with.

With the molars a large surface and a sufficiency of room for secure anchorage is especially favorable to success.

In the fourth class of contour fillings the incisors and cuspidati are restored when worn away by occlusion or abrasion, as it is called. This may be spontaneous or mechanical, but here reference is made to the latter, (though the remedy is the same in either case) usually caused by the loss of the back teeth, when all the force of occlusion is distributed to the anterior part of the mouth, thus making the palatine a grinding surface and necessitating the substitution of gold for the lost tooth structure, in order to prevent further

abrasion, preserve vitality, if not lost, and render the teeth more efficient in mastication.

The palatine surface may not only be included in the loss, but where the teeth strike perpendicularly together—the cutting edges meeting—the crowns may be worn away the entire diameter of their axes. Usually, however, the labial wall will be standing—wholly or partially intact. That is, the anterior and posterior palato-proximal and the palatine surfaces will always be involved, and sometimes, when the case is complicated with caries, the anterior and posterior labio-proximal surfaces.

All will admit the practical value of restoration in cases as described, if perfect antagonism is maintained, and firmly anchored fillings of cohesive foil are solidly impacted with mallet force.

In cases like the foregoing the extensive loss of dentine is usually followed by absorption and recession of pulp tissue, produced by the aggression of the antagonizing tooth upon the territory of the latter; but the diminished pulp often retains its life by throwing out for its covering and protection a deposit of secondary dentine—the abrasion producing just enough healthy inflammatory action for the purpose.

The fifth and last class of cavities requiring a restoration of contour, and a substitute for the portion lost by decay, merit more than a passing notice, because such, especially when any considerable number are involved, would, by the majority, probably be counted as worthless and past remedy. But such teeth, and the necessary operations to be performed, can be best described and illustrated by citing a case in practice, to which reference has before been made, as an example of the ravages of caries in a mouth in which the secretions were excessively alkaline, and also of the effect of these upon Guillois' Cement with which some of them were at first filled. (See *Dental Register*, July, 1872, Vol. XXVI, page 59.)

In these teeth cavities were present in almost every conceivable location, not excepting the lingual surfaces of the

inferior right and left, first and second molars—the cavities running transversely and groove-like, just about the margins of the gums. But the six superior front teeth had deep and nearly crescent-shaped cavities extending on the labial surfaces, to and above the margins of the gums, and downward to such an extent as to give the appearance of being, when filled—gold crowns with enameled cutting edges.

The anterior and posterior labio and palato-proximal angles were also involved, leaving in some cases, a narrow neck of enamel on the palatine surface at the narrowest portion separating the two ends of the two-third or three-quarter circles of gold, with which the teeth were encompassed. Thus each pulp was protected by a mere thin covering of dentine, for none were exposed though the cavities were deep; and the young man might with propriety have exclaimed in the words of Job, "I am escaped with the skin of my teeth."

During the operation of filling these teeth the rubber dam was employed, as in the majority of cases it should be, and though it seemed impossible to adjust it perfectly and satisfactorily to the labial surface of a root, above a cavity, where the same extended much above the margin of the gum, even in this particular location it afforded material aid, as by keeping it on a stretch at this point, it acted as a compress and kept the gums, which were then unhealthy, from exuding those peculiar, viscid, and almost imperceptible secretions, which often prove so annoying without the dam is employed. Aside from this little difficulty sometimes met with, its perfect adaptation to the tooth otherwise, is attended with great benefit during operations on other parts of a cavity of this description.

Wedges were also introduced between the teeth, and assisted greatly in keeping the dam in place. Here they are indispensable.

Thus the fillings were kept dry during every operation, perfect adaptation of the gold to the borders of the cavities

was secured, which rendered them air and moisture-tight—so that every filling is as it should be—faultless; and presents a compact, flush, smooth and mirror-like surface—in fact a restoration of contour. The time and material employed, as to amount in each case, ranged as follows:

Right central incisor—time, $5\frac{1}{4}$ hours—gold 1 dwt. 8 grs.
Left central incisor—time, $6\frac{3}{4}$ hours—gold, 1 dwt. 12 grs.
Right lateral incisor—time, $7\frac{3}{4}$ hours—gold, 1 dwt.
Right cuspidatus—time, $7\frac{3}{4}$ hours—gold, 1 dwt. 6 grs.
Left lateral incisor—time, $5\frac{1}{2}$ hours—gold, 22 grs.
Left cuspidatus—time, $5\frac{1}{2}$ hours—gold 2 dwts.

The left inferior canine is also filled in the same manner.

Subsequently the gums received proper treatment, and not being longer subjected to the irritation which they once received from overlapping the jagged edges of the cavities, are now hard and healthy.

These teeth were pronounced past remedy five years ago, and the question would be asked by many, will this class of operations pay, so far as durability is concerned—bounded as the fillings are on the cervical borders by cementum? perhaps the reply would be in the negative, even though strict regard was had to cleanliness by the patient.

Will not caries again recur at the line of junction of the cementum and the filling?

The fillings in the above case were inserted during the past year, and therefore sufficient time has not elapsed to determine with any certainty as to the recurrence of caries at the margins of the gums, but the probability is that cleanliness will prevent this.

This may be considered an exceptional case in practice, considering the destructive type of the disease, or the magnitude of the loss and restoration, and the time, labor and skill necessary to be employed, and the difficulties to be overcome in the introduction of the gold.

If perfect operations will insure success the preservation of these teeth is certain. The life of the pulp was in every case maintained.

These fillings might not be strictly defined as contour as the term is usually applied, but as the restoration of the greater part of every surface was included in most of them, the term would seem appropriate.

It would seem that caries would be likely to attack the healthy cementum borders of cavities bounded by the latter, even if the fillings were perfect, and cleanliness were maintained; but as the cementum has more vitality than the enamel, and more direct sources of nourishment, receiving it directly from both pulp and periosteum, this might serve to overbalance the danger which would ensue when exposed, from its having a greater amount of organic constituents than other parts of the tooth.

But when cementum becomes exposed it is not in a normal condition, and is not therefore in a state to resist disease, as it would be if protected by its natural covering. Neither is the dentine, when unprotected.

But the latter is sometimes enabled to check the further progress of caries, by a deposition of ossific matter in the tubuli, thus rendering it harder and denser, and less capable of being influenced by the action of chemical agents—and perhaps the cementum is subject to the same law of defensive warfare.

But this is a question to be determined by those best capable of judging.

If the fluids of the mouth were excessively alkaline the cementum would be more likely to suffer than if the reverse were true, containing as it does more organic matter than the enamel and a little more than the dentine, or according to an analysis by Lassaigne, nearly one-half, as will be seen by the following table:

Organic matter		42.18
Phosphate of lime . . .	53.84	
Carbonate of lime . . .	3.98	57.82
		100.00

Von Bibra, however, makes the cementum to contain:

Organic matter	29.27
Earthy matter	70.73
	100.00

Making the chemical composition of the dentine and cementum of nearly the same proportion.

Alkalies seize upon the animal portions of the teeth and remove them, and thus produce caries, as seems to have been the effect in this case. This class of cavities, and what was done in this instance has been partially explained and described, and yet more fully than any other, in order to direct attention to the question: What are the chances in favor of the permanent effects of such treatment in caries of the teeth, of which the last described has been presented as a specific type, form or example?

And here I would rest the matter by asking your indulgence for the unintentional length of this paper, which it has seemed quite difficult to confine to narrow limits, without taking more time than could be consistently devoted thereto, and which is requisite in order to canvass a subject in all its bearings, and yet retain only the pith or essence or the full meaning by a condensation of matter.—*Missouri Dental Journal.*

ARTICLE V.

The Brain Power of Man. Has he Two Brains? or has he only One?

A LECTURE BY DR. BROWN-SEQUARD.

Dr. Sequard commenced by saying that his view, he hoped, being somewhat novel, would command attention. The facts he would dwell upon were new, probably would not be generally accepted, and perhaps would not be easily understood by those not familiar with medicine.

Have we two brains? and, if so, why not educate both? The views of science upon this subject were different from his. The left side of the body was the side affording volition to the brain, and, *vice versa*, the right side of the brain afforded volition to the body. Eminent authorities had declared that either side of the brain was competent for this purpose.

But we use only one side, and, therefore, leave out of account one-half of brain matter. We owe due education to both sides of the brain, or, rather, to the two brains.

As to intelligence, the eminent authorities he had cited established the fact that either side of the brain was competent for full development of the brain faculties. There were many persons of two minds, because they were never able to make up their minds. Some men claimed to be rational while they were insane. There were many cases that show clearly that there were two brains. He had known a boy in London that manifestly had two brains, whose peculiarities he described. He would fall into a comatose staté, and suddenly open his eyes brightly, inquiring of his mother why he was not introduced to the gentleman who was present while he was asleep. Again, the lecturer saw him when the boy recognized him. He had two mental lives. He knew nothing of what occurred in his sleeping condition, when fully awake; and when in the latter condition he knew what had occurred when in the former. The leeturer had seen three cases of this kind.

As regards faculty of speech, the fact that we had two brains was not so easily proved. The loss of the faculty of expression depends upon disease of the left side of the brain; and this proves that the right side is distinct.

As regards sight, a theory has been put forth by a celebrated physician of London that the right side of the base of the brain is the centre of sight. The inner half of the right eye and the outer half of the left eye have the base of the brain as the centre. A disease in the left side of the brain, where the optic nerve touches, would therefore affect

only one-half of the brain. Notable cases were given in which parties had seen but one-half of certain objects that they gazed upon. If the disease exists only in the left side of the base of the brain, only one-half of the eye will be affected. So there are many cases that go to sustain the philosophers. But we do not accept conclusions unless theory is thoroughly supported.

There were three series of facts, but one would be enough to show that the theory should be rejected. Disease of the brain where the optic nerve touches, would not be sufficient to cause loss of sight. One side of the brain would be sufficient to sustain sight. An alteration in any portion of the nervous system, acting upon other parts, can produce disease in that part. Injury to the spinal cord would produce loss of sight on either side. There was nothing more common than the loss of sight temporarily in children who suffered from worms in the stomach. An injury in one-half of the brain can exist without producing loss of sight. Either half of the brain may, therefore, serve to sustain sight.

As to the voluntary movements, these depended upon the action of the body. Yet there were many small muscles which were not affected in cases of paralysis. There were cases on record in which it was shown that the lower lobe of the brain could be destroyed without affecting these voluntary movements. There were several such cases. We must, therefore, look on one-half of the brain as being sufficient to sustain voluntary movements on both sides of the body. An irritation in any part of the brain may affect any part of the body, and an irritation in any part of the body can produce paralysis in another part. The irritation could also act upon remote parts. This shows that the power of will does not control the entire action of the body. When paralysis occurs it depends upon irritation.

The same reasoning applies to sensation. There were thousands of cases affecting the brain that did not effect the feeling. Passing these facts in review we find vast differ-

ences owing to the fact that one-half of the brain was developed for certain things and the other half for other things. To the left side of the brain belonged the faculty of expressing ourselves by speech. Articulation depended in great measure upon the left side of the brain. Difficulties in the mechanical point of speech were more frequently found when the left side of the brain was diseased. It was the mental part that was lost, and not the mere mechanical action. The left side of the brain was also the motive power of gesture. When the left side was diseased, patients lost the power of gesticulation.

As regards writing, it was lost more frequently in diseases of the left side of the brain. The right arm was paralyzed by diseases of this side. Many thus diseased could not write from memory, although they could use their fingers and copy. In those cases it sometimes occurs that persons could not write at all.

Intelligence depends more upon the healthfulness of the left side than of the right side of the brain. The right side of the brain in some cases has the power of the left, if properly developed. This serves to hysterical developments aud to nutrition of the body. One, the left, applies to mental, the other to the natural life.

The right side of the brain operates upon the limbs in cases of paralysis and other diseases; also upon disturbances in the lungs, liver and other parts. Hysterical and emotional symptoms are more common in cases of disease of the right side of the brain; out of 120 cases of paralysis that came under the lecturer's observation, there were 96 caused by disease of the right side. An alteration of the retina of the eye will come more frequently from diseases of this side of the brain. Out of 69 cases of convulsions of the eyes, 47 were due to diseases of the right side. Death occurs much more frequently by disease of the right side of the brain, and in case where patients do not die it will produce more extensive and enduring paralysis.

All this shows not that the two sides of the brain differed originally, but that there were different developments of

each. The left side of the brain was much larger than the right side. If a person went frequently to the same hatter, he would find that his hat had to be from time to time enlarged. There was no question that the brain grew. By studying a particular subject the person became proficient, and the brain was more fully developed.

There was no doubt that the left side of the brain predominated in our system. Our being right-handed showed it. There was no population in the world that was not right-handed. The right hand of the body was mostly used. Left-handed individuals used the right side of the brain, showing the connection between these things.

There was primitively a difference between the two brains. In children convulsions were sooner developed in the left than in the right side of the brain. This was attributable to excess of blood in the left side. Parrots roosted on the right legs, and their talking power came from the left side of the head.

There were four vital points to be considered. The first was that asphyxia was connected with the left side of the brain in persons that were right-handed, and with the right side in those that were left-handed. The second point was that children who were first learning to talk, if disease came in the left side of the brain, learned to talk just as well with the right side of the brain. Though losing half of the brain they got along just as well.

This proved that the right side could be educated, with the left hand for execution. The third point was, that four out of every hundred left handed persons learned to write with the left hand; therefore the left side of the brain, even with persons left-handed, could be educated better than the right side. The fourth point was that the leg was rarely so much affected by paralysis as the arm. He, however, would pass over this argument, as it could only be understood by medical men.

If the lecturer had established that we had two brains, then they should be developed. If we could develop the

legs and the arms of both sides, we could develop both sides of the brain. If we gave as much attention to the left side of the body as we do to the right side, we would fully develop our two brains. The important point, therefore, would be to make children use both sides of the body—alternately using the right and left arm and the right and left leg equally. There would be no difficulty in thus training children to full development.

Even adults who had lost speech by disease of the left side of the brain, could regain the power by cultivating the right side. In gesture, persons who had lost the use of the right arm could be trained to use the left. If children were thus trained, we would have a sturdier and healthier race, both mentally and physically.—*National Republican.*

ARTICLE VI.

Cremation.

The subject of cremation is again taken up by Sir Henry Thompson in the pages of the *Contemporary Review.* In this article he replies to various criticisms that have appeared in different journals, and gives a detailed account of the process he would suggest as most appropriate for the object in view. Sir Henry states, and it is certainly a somewhat remarkable fact, that the only formal opposition to cremation has been made by the present medical Inspector of Burials for England and Wales, Mr. Holland; and in reply to the observations of this gentleman, Sir Henry refers to the evidence obtained by Drs. Southwood Smith, Waller, Lewis, and others, in regard to the large amount of gases produced in the decomposition of the body, and the impregnation of soil, water, and air to a considerable distance. Such impregnation by the dead, and consequent danger to the living, cannot, we presume, be questioned for a moment, and is fully borne out by the statements of Mr. Bowie, and the general experience of the profession. We must also

fully endorse Sir Henry's remarks in regard to the elimination of ammonia, or at least of carbonate of ammonia, from decomposing animal tissues, and are at a loss to understand how any doubt can exist about the point. Turning to the second part of Sir Henry Thompson's essay, he remarks that he has personally superintended the turning of three bodies of animals, one weighing 47 lbs., another 140 lbs., and a third no less than 227 lbs., with the most satisfactory results, the residue in the first instance weighing only 1¾ lbs., and in the second 4 lbs. In the last case the body was placed in one of Dr. Siemen's furnaces, the interior of which was heated to about 2000° F. The inner surface of the cylinder, which was about 7 feet long by 5 or 6 feet in diameter, was smooth, almost polished, and no solid matter but that of the body was introduced into it. The gases, which were at first abundantly given off, passed through a highly heated chamber, among thousands of interstices made by intersecting fire-bricks laid throughout the entire chamber, lattice fashion, in order to minutely divide and delay the current, and to expose it to an immense area of heated surface. By this means they were rapidly oxidized, and not a particle of smoke issued by the chimney. No second furnace was therefore in this instance requisite, though, under certain circumstances, the products of combustion might be transmitted through another, and the fumes from this into a third, and so on, each being made available for the combustion of one body. The process was completed in fifty-five minutes, and the ashes, which weighed about 5 lbs., were removed with ease. Sir Henry meets the objection that has been raised to the practice of cremation, that it will lead to an increase of crimes of poisoning, by suggesting that a public verificator of the cause might be appointed, whose duty it should be to ascertain and certify the cause of death, whilst the stomach might be kept for some years. In reference to the expense, he still thinks it would be far within the present cost of a funeral. As regards ourselves, we have already expressed our opinion that it is an emi-

nently satisfactory mode of disposing of the dead—safe, speedy, wholesome, and economical; but we rather doubt whether ancient custom and popular prejudice can be so easily overcome and altered as Sir Henry Thompson appears to believe.—*Lancet.*

EDITORIAL, ETC.

Bromide of Potassium in Convulsions and Dental Irritation.—Prof. Lewis Smith, in a paper read before the N. Y. Academy of Medicine, speaks of this remedy having been employed with marked success in convulsions of Infants:

"Three cases were mentioned belonging to this class. In the first case ½ gr. doses of the remedy were administered every two hours. Recovery. In the second case, two grains were given every three hours. Recovery. In the third case ¾ of a grain was given every three hours. Recovery.

In cases of *trismus nascentium* the bromide is much inferior to hydrate of chloral, for occasionally a case of this affection recovers under the influence of chloral, but the bromide of potassium is of no special service.

Dental Irritation.—The remedy, in this class of cases, is so so salutary in its effects, that the gum-lancet need scarcely ever be resorted to. It is to be administered in doses proportionate to the age of the child, and repeated according to circumstances. The remedy is of service in the treatment of all local diseases except gastro-intestinal irritation and renal disease, where convulsions are threatening."

How New York Physicians and Dentists get a Competence.—From a New York letter in a daily paper we take the following:

"A physician in good practice will receive patients at his house four hours daily, and make calls for about the same length of time. From ten to twenty callers, and half as many house patients, would be a fair average; the fees would be two and five dollars each. At these figures it would not be hard to make up an income of $20,000 or more. It is said of Dr. Williard Parker, I believe, that having been called out of town to attend a patient, returned a bill of $300, and when it was disputed, he showed by his books that his daily receipts were much over that sum.

Surgeons single charges are much larger than those of physicians, though the income of the latter are probably the highest. For ordinary attendance their rates are about the same, or say $5 a visit. From $25 upward is the charge for operations. For setting an arm or leg $250 would be asked, larger undertakings being in proportion. For a case requiring delicate operation and six weeks' constant attendance, sometimes two or three times a day, $1,000 was lately asked by a leading surgeon. In another instance, where a wealthy gentleman was badly jammed by a railroad car, he was attended by Dr. James R. Wood, who made about a dozen visits, without any important operation, and sent in a bill of $2,500, which was paid.

This is exceeded by Dr. Carnochan, who charged $2,000 for an operation alone, while another surgeon is said to have received $4,500 from one patient. The prices charged by dentist's are quite as high as those of physicians. A man of ordinary reputation in the profession will ask from $5 to $30 for pulling a single tooth, while Dr. Atkinson, one of the most fashionable dentists, is reported to charge $10 for simply examining a person's teeth, and $25 an hour for operating upon them. Many people refuse to pay these fancy prices, but it is a common thing to have to pay from $10 to $100 dentists' bills.

Most practitioners of any reputation have engagements very far ahead. Ten days is a short time to wait for your turn, while a friend of mine. who went to Europe in the middle of last October, on applying to her dentist for treatment, was told that he could not give her a single hour's heed until February, or nearly four months in advance. Dentists are kept busy all the year round, and seldom have any leisure. Their practice is confining and not healthy, but it is very profitable. Their incomes range from $5,000 to $50,000 a year."

Death while under the Influence of Chloroform.—Mr. Samuel Hartzel, of No. 166 Pearl Street, Baltimore, died very suddenly while under the influence of chloroform. It seems that about two weeks ago, Mr. Hartzel dislocated his left shoulder, and yesterday his physicians, Drs. Butler and Keller, desiring to perform an operation which they considered necessary, administered chloroform. While Mr. Hartzel was enhaling the vapor, he was seized with a violent spasm, during which he died. Every effort was made to resuscitate him but without success. It was the opinion of the physicians that death resulted from heart disease, as the deceased had been subject to attacks of that affection. As Mr. Hartzel's relatives would not permit a post mortem examination, the coroner declined holding an inquest.

The Agassiz Memorial—Teachers and Pupils Fund—"Louis Agassiz, Teacher.—This was the heading of his simple will; this was his chosen title; and it is well known throughout this country, and in other lands, how much he has done to raise the dignity of the profession, and to improve its methods. His friends, the friends of education, propose to raise a memorial to him, by placing upon a strong and enduring basis the work to which he devoted his life, the Museum of Comparative Zoölogy, which is at once a collection of natural objects, rivalng the most celebrated collections of the Old World, and a school open to all the teachers of the land.

It is proposed that the teachers and pupils of the whole country take part in this memorial, and that from the birthday of Agassiz, the 28th day of May, 1874, they shall each contribute something, however small, to the TEACHERS AND PUPILS' MEMORIAL FUND, in honor of LOUIS AGASSIZ; the fund to be kept separate, and the income to be applied to the expenses of the Museum.

John Eaton, Commissioner of Education, Washington, D. C; Joseph Henry, Secretary of the Smithsonian Institution, Washington, D. C; Joseph White, Secretary of the Board of Education of Massachusetts, Boston; W. T. Harris, Superintendent, Public Schools, St. Louis, Mo.; Edward J. Lowell, Boston John S. Blatchford, Boston; Jas. M. Barnard, Treasurer Teachers and Pupils Fund, Boston.

All communications and remittances for the "Teachers' and Pupils' Fund" of the "Agassiz Memorial," may be sent to the Treasurer, Jas. M. Barnard, Room 4, No. 13 Exchange Street, Boston.

MONTHLY SUMMARY.

Carbolic Acid in Carbuncle.—Mr. Peter Eade describes a case of carbuncle treated by carbolic acid, in the *Lancet.* He says: Into the centre of the two holes which had formed I pressed with a probe some threads of lint soaked in a strong solution of carbolic acid in oil (one part to four,) and I also laid a piece of lint wet with the same over their apertures, so as to supplement the small quantity which the shallow sinuses would contain. A little smarting was complained of, but the application was repeated after a few hours, and again the following day. Almost at the end of twenty-four hours it could be perceived that a check had taken place in the morbid process, but by the next day it was plainly evident that the inflammation and induration were really beginning to subside. The carbolized lint was still carefully and scrupulously thrust to the very bottom of the small holes, and from this time no further spread of the disease took place, but, on the contrary, there was a rapid subsidence of the œdema, and in two or three days more, little remained but some diffused swelling of the lower lip, some tender induration at and around the seat of the original pimple, and the ragged discharging opening which had formed at the site of the primary festers. The disease was therefore stayed, and in a few days more the patient was convalescent. I have now used carbolic acid in this way in several cases of carbuncle; and in all of them its application has been followed by a uniform and immediate check to its increase, and a speedy amelioration of the local conditions. When it has been applied early, it has plainly gone far to abort the disease; and when it has been commenced later, wherever it could be brought into contact with the inflamed and hardened tissue, there at least no further spreading has taken place, whilst swelling and tension have diminished, and dirty suppurating slough has quickly given place to florid healthy granulation.

And from my observation of its action, I entertain no doubt that, if it could be brought sufficiently early into contact with the spreading disease, it would be quite competent to prevent its extension beyond the degree to which it had already advanced. Unfortunately, the acid appears to have little or no influence when applied over the unbroken skin; but directly it can be brought into contact with the diseased mass, either by being inserted into the sieve-like holes, or by being applied to it after being laid open by incision, its beneficial action becomes at once manifest.—*Medical and Surgical Reporter.*

Disease-Destroying Tree.—M. GIMBERT, who has been long engaged in collecting evidence concerning the Australian tree *Eucalyptus globulus*, the growth of which is surprisingly rapid, attaining, besides, gigantic dimensions, has addressed an interesting communication to the Academy of Science. This plant, it now appears, possesses an extraordinary power of destroying miasmatic influence in fever stricken districts. It has the singular property of absorbing ten times its weight of water from the soil, and of emitting antiseptic camphorous effluvia. When sown in marshy ground it will dry up in a very short time. The English were the first to try it at the Cape, and within two or three years they completely changed the climatic condition of the unhealthy parts of the colony. A few years later its plantation was undertaken on a large scale in various parts of Algeria. At Pardock, twenty miles from Algiers, a farm situated on the banks of the Hamyze was noted for its extremely pestilential air. In the spring of 1867 about 13,000 of the eucalyptus were planted there. In July of the same year —the time when the fever season used to set in—not a single case occurred; yet the trees were not more than nine feet high. Since then complete immunity from fever has been maintained. In the neighborhood of Constantine the farm of Ben Machydlin was equally in bad repute. It was covered with marshes both in winter and summer. In five years the whole ground was dried up by 14,000 of these trees, and farmers and children enjoy excellent health. At the factory of the Glue de Constantine, in three years a plantation of eucalyptus has transformed twelve acres of marshy soil into a magnificent park, whence fever has completely disappeared. In the Island of Cuba this and all other paludal diseases are fast disappearing from all the unhealthy districts where this tree has been introduced. A station-house at one of the ends of a railway-viaduct in the department of the Var was so pestilential that the officials could not be kept there longer than a year. Forty of these trees were planted, and it is now as healthy as any other place on the line. We have no information as to whether this beneficent tree will grow

in other than hot climates. We hope that experiments will be made to determine this point. It would be a good thing to introduce it on the West Coast of Africa.—*London Med. Times.*

Extraordinary Malpractice.—The following account is sent us by a correspondent in Baltimore. It is needless to say that the two physicians were both irregular practitioners. A young lady had been ill some time, and her sapient advisers decided she had Bright's disease, for which they prescribed a *turpentine vapor bath*. The bath was administered under the supervision of the doctors (?) in the following manner :—The patient having had the clothing removed, and been enveloped in blankets, was placed upon a chair with a hole in the seat. Beneath her was suspended a tin vessel containing the turpentine, and under it was placed a spirit lamp. The chair was covered with blankets and the lamp lighted. In a few minutes the patient sprang from the chair, exclaiming that she was on fire, simultaneously an explosion occurred, disseminating the ignited fluid about the chamber. The lady was terribly burned in the regions of the nates and thighs. She suffered excruciating agony during the three succeeding days, when death relieved her. The authors of her sufferings stated that they regretted exceedingly the unfortunate accident; (?) that it was an experiment they had never before tried, but from which they had hoped good results; that the small quantity of vapor, with which she had come in contact, had *already greatly benefited her kidneys*; and that the accident did not materially affect the result, since her case was hopeless. —*Medical and Surgical Reporter.*

Chloral Hydrate and Camphor as a Local Application in Neuralgia.—It is stated that the intimate mixture of equal parts of chloral hydrate and camphor will produce a clear fluid which is of the greatest value as a local application in neuralgia. Mr. Lenox Browne relates (*Brit. Med. Jour.*, March 7, 1874) that he has employed it and induced professional friends to do so, and that in every case it afforded great, and in some instantaneous relief. "Its success does not appear," he says, "to be at all dependent on the nerve affected, it being equally efficacious in neuralgia of the sciatic as of the trigeminus. I have found it of the greatest service in neuralgia of the larynx, and in relieving spasmodic cough of a nervous or hysterical character." It is only necessary to paint the mixture lightly over the painful part, and to allow it to dry. It never blisters, though it may occasion a tingling sensation of the skin. He has found it also an excellent application for toothache.—*Med. News and Library.*

Poisoning by Cantharidal Collodion.—Dr. ERNST SCHWERIN, of Berlin, reports a case (*Berliner Klinische Wochenschrift*) of poisoning with cantharidal collodion. The patient, a woman aged twenty-three years, swallowed, through mistake, fifteen drops of the preparation. After about an hour had elasped she was attacked with cramps in the lower part of the abdomen, for which previously to sending for a physician, numerous household remedies were used. The doctor upon his arrival found the patient running about the room, with the arms crossed upon the abdomen, stopping after every few steps to void a few drops of urine, the passage of which was attended with intense pain. At times she fell into a species of catalepsy. The pulse was small and of moderate frequency. For some days albumen was found in the urine. Under treatment, she at the end of a few days was entirely recovered. It is interesting to notice that the sexual passion was not at all excited by the drug; and this goes to confirm the opinion of later observers, that the older physicians were mistaken in attributing aphrodisiac qualities to it. —*Phila. Med. Times.*

Remedy for Tooth-ache.—Dr. Q. C. Smith, of Cloverdale, writes us:—Having spent a number of years of my professional life in the couutry, where no dentist was near, and therefore being often called to prescribe for tooth-ache, I tried many combinations of drugs, and many published formulas, with more or less satisfaction to myself and patients. But several years since I hit upon the following combination, which I have found better than any I have ever used, and it will give relief in almost all cases where such a remedy is applicable:

℞. Carbolic acid, saturated solution; hydrate of chloral, saturated solution; camphorated tinct. of opium; fluid extract of aconite, of each an ounce; oil of peppermint, ½ oz. Mix. Apply by saturating a pledget of cotton, (or preferably a small piece of sponge) and pack closely into the cavity of the decayed tooth.—*Pacific Med. and Surg. Journal.*

A New Sign of Death.—M. Bouchut stated, at the Academic des Sciences, that at the moment of death gases which are normally imprisoned in the venous blood are disengaged, forming a pneumatosis of the veins. The pneumatosis of the veins of the retina is easily appreciable by the ophthalmoscope, and constitutes an immediate and certain sign of death. This pneumatosis is indicated at the moment of death by the interruption of the column of blood in these veins, a phenomenon similar to that which is observed in the interrupted column of a thermometer with colored alcohol.—*Med. and Surg. Reporter.*

A Dentist Fined.—An action against a dentist for pulling the wrong teeth came before a court in New Hampshire, the other day. The plaintiff, being unavoidably absent by reason of having died, her interests were represented by her husband, who asserted that his wife gave the dentist special directions to pull certain teeth, and not to molest certain other teeth ; but he made a clean sweep of one jaw, and was rapidily harvesting the crop in the other, when the patient recovered from the anæsthetic and shut her mouth. The suit was for $5,000 damages, but the jury considering that it might have been a mere misunderstanding on the dentist's part, and that the plaintiff was dead, thought $20 about right.—*Druggist's Circular.*

Successful Case of Transfusion.—Prof. Liedeshorf, of Vienna, reports, (*Allgemeine Medicinnische Central-Zeitung*, Feb. 18, 1874) a successful case of transfusion resorted to in the case of a man, aged 23 years, who, in consequence of heavy pecuniary losses, had become greatly depressed, and had finally fallen into a cataleptic condition, which had lasted three weeks. Reflex sensibility was greatly impared, and no relief was experienced from the application of electricity. As a last resort, recourse was had to transfusion, and three ounces of blood were therefore injected. The temperature at once rose from 36° to 39·5°, and the pulse from 45 to 80. The patient began shortly after to speak ; the cataleptic symptoms gradually disappeared, and complete recovery rapidily ensued.—*Boston Med. and Surg. Jour.*

Monstrosity.—Dr. Balle presented the other day to the *Faculte de Medecine*, a young girl aged fourteen, named Blanche Dumas, from Issondun, whose body, from the waist downwards, is double—the two parts acting independently of each other. The two legs she uses for walking belong each to a different trunk, while a third one is quite insensible to pain. Her health is good.—*Lancet.*

A New Dental Hospital.—The new dental Hospital, situated in Leicester Square, London, was formally opened upon the 2d of March, upon which occasion an address was delivered by Edward Sercombe, Esq., the President of the Odontological Society.

Death from Chloroform and Hemorrhage.—Mrs. George W. Wilson, in Chester, Pennsylvania, took chloroform a few weeks ago, and had fifteen teeth extracted. She died in a few minutes under the combined influence of hemorrhage and chloroform.

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ARTICLE I.

Protoplasm—Its Relation to Vitality.—Continued.

BY H. R. NOEL, M. D., PROFESSOR OF PHYSIOLOGY.

Valedictory Address delivered February 26th, 1874, at Baltimore College of Dental Surgery.

Animal World.— We turn now to the animal, and we seek the solution of the new problem of protoplasmic activity in that kingdom to which man belongs.

Has vitality in the animal a different meaning from vitality in the plant? Has "vital force" a different significance, and are its laws of manifestation in any respect different? What are the conditions of simply life in man? To eat, to drink, to breathe, to be kept warm. Food—water, oxygen—light and heat!

Eliminating oxygen or air from the discussion for a few minutes, we will consider the other conditions, and find that they are the same for the plant and for the animal; and the agent which manipulates these conditions is also the same; then the phenomenon of growth and development in the two

are identical, or so very nearly so, that any radical distinction between them is not at present possible. And we are justified in the conclusion that whatever is predicable of protoplasmic activity in the one, is predicable of it in the other.

A critical analysis of "vitality," as shown in the vegetable kingdom, as already given us, "construction," as the type of such life, where force *dynamic* becomes force *static*; what then is a vast forest but the *storehouse* of the *past*? And the venerable tree of a thousand years' growth, one which has lived through the rise and fall of nations, empires, dynasties, has through that long period been steadily but quietly preserving the light and heat of the sun, and will one day return, yes, inevitably return again to the dynamic form, all the force which for so many years it has held in the static.

The very essence then of "*vitality*" is the accumulation of material and the accumulation of force; and from the sprouting acorn to its culmination in the towering oak, the steps present one unbroken continuation of accretion, aggregation, growth. Then, if this be the history of vitality in plants, and we share with plants this *vitality*, it has a similar history in us, and the analysis of "vital force" in animals and in man must show that same accumulation of material and accumulation of static force.

The Egg.—There is an experiment in nature, which is so beautiful in its pure simplicity, so instructive in its scientific history, so attractive in its synthesis, and yet so perfect a demonstration of the identity of vitality in the two kingdoms, that I can not resist the temptation to give you a short account of it—an *epitome* it is—"'Tis only the hatching of an egg?" You may smile at so apparently plain a thing, yet this contains the key-note, the very arch and key-stone, and we shall be unwise builders if we neglect it.

An egg—analyzed it is albumen and yolk, with *some* masses of protoplasm; the white and yolk are material, the protoplasm is of course the worker, mason, the carpenter,

the architect, the builder; these protoplasmic agents remain quiescent until stimulated by heat, and then they immediately begin to work, and if the heat be steadily applied, they will in from 14 days to 30 days consume all of the material and a large amount of the heat, and in the place of the white and yolk there will be a living animal, a bird.

Will you be so kind as to recall the elements of this equation, and to retain them as I repeat them. Material+protoplasm+21 days' heat=one living animal. Now there is here no obscurity, no vague and untenable hypothesis, no visionary theories, but simply facts of observation, facts which philosophers can not misunderstand, and which physiologists can not but explain clearly; the white (albumenoid,) the yellow (oleaginous,) and the masses of protoplasm under continued heat have disappeared, and in their places a living animal is given us. There is and can be but one explanation of this change, and it is the plain statement that the protoplasmic agents have gone to work, and consumed the material in the manufacture of this animal, and they have also consumed the force called heat. But as heat is a force it is indestructible and continuous, and hence the "vitality" shown in the manufacture of this bird, being also a form of force, I must assume that the physical has by correlation become a *vital force*. Pardon the repetition, but I cannot too warmly or too earnestly commend to your thoughtful consideration this intensely interesting and lucid experiment of *animal building*. The statements are so few, the chance of misconception so small, and the result so perfect, that one cannot but recognize the same force, same conditions, same laws of action, and *same* final result, running in a linked series through both kingdoms; and if in the oak and all other species of vegetable productions, the essence of "vital force or protoplasmic action" be the accumulation of material and the accumulation of force, then will its essence be the same in the "*animal kingdom*," and an animal is but the expression of re-arranged *material* and *static* force. The re-arranged material we find in the

feathers, flesh, blood and bones of the bird, and we here accept the evident change of form; but the heat which has been consumed, and which re-appeared as "vital force," and which has played so important a part in animal building, is it indeed rendered static? Is any heat or any form of force stored up with the material which we call the flesh? The answer to this question is easy indeed; the bird has a muscular system, nervous system, and a brain, and the very hour it emerges fram the shell, it gives us evidence of muscular force and nerve force; it runs and it cries. Now this "muscular and nerve force" which is *hatched with the bird*, must of course have been in a *static condition* in the system of the bird prior to hatching, and if that be true, as of necessity it must be, then we can trace the ascending "form of *heat*" through "*vital force*" into *static animal force.*

Now the animal forces are, muscular force, nerve force, and brain force, and at the very dawn of active animal existence, we find those forces ready in the animal, and they have only to be changed in form from the static to dynamic.

Force is stored up in muscle, it is stored up in nerve centres, it is stored up in that great nerve centre, the brain; and moreover it has been stored there by protoplasmic activity. In plainer language, the muscle is built and force is put in it; the brain is built and force is put in it, and the evolution of these forces from their static condition is animal life. All *animal force* depends therefore upon a prior existing "protoplasmic activity," called vital or vegetable force, and we can also conclude that the animal forces are directly as the pre-existing "vital force," which primarily constructs the tissues from which are evolved the animal forces.

The Change from Static to Dynamic.—A very pertinent inquiry put at this stage, is in what manner is this static force evolved or made dynamic? Now in the liberating of light and heat, which are static in *coal*, *wood*, oils, &c, we

must have chemical destruction, chemical change, before the light and heat are rendered dynamic; you can only get the *active* or *dynamic* form by breaking up the *material conditions* of the *static*. Now is this also true of muscle and brain? Do we only get muscular force by destruction of muscular tissue and brain force by destruction of brain tissue, just as we get light and heat by destruction (we mean chemical only,) of the combination which holds them static? I think the answer is undoubtedly in the affirmative; and brain force means brain destruction, muscular force is muscular destruction. Then all exhibitions of animal force are essentially destructive to the tissue, acting and muscular work means muscular waste, and brain work means brain waste; but how is this tissue destroyed in the functional activity of brain and muscle?

We burn coal to get heat and light: so we also burn brain and muscle to get intellectual action or brain force and motion or muscular force?

Again I answer in the affirmative, and now we see at least ONE very important use of oxygen which we breathe in the air; though oxygen is also useful in other combustions going on in the animal system. Atmospheric air contains 79 nitrogen and 21 oxygen, and we (each one,) fill and empty the lungs 17 times in a minute; we use about 2½ to 3 lbs. of oxygen every day, and we use 800 lbs. in a year; we use also 800 lbs. of food in a year, and hence we see that while food is evidently for constructive use, the oxygen is for destructive; one is therefore as essential as the other. A man then has two kinds of life, the first one essentially constructive and storing up; second one essentially destructive and liberating.

Man is in one sense a furnace, and the faster he burns the more force he sets free, but the supply of muscular and brain tissue is limited, and if burned too fast, we burn out too soon. It is fortunate for us that those protoplasmic agents which primarily construct our muscles, nerves, brain, and every other tissue and structure of the body, do not

leave their work unguarded, but many are left to watch these tissues, and as they waste away these agents repair them. The blood furnishes an ever present supply of building material, and it also dissolves and carries off the burned elements as a soluble ash; the protoplasm obtains from the blood the materials with which to first construct, and second, maintain the integrity of the animal; so it not only builds, but it watches and incessantly repairs the waste.

From these propositions you at once conclude that *man* is a *machine*, which must be constructed before it is worked; and you also perceive the vast difference between the "*constructing agent*" and the machinery constructed. The agent builds the machinery and the process of building we call growth and development, but the working of this machinery is another thing, and this other thing is animal life. We have therefore a double life. 1st, vitality, eminently constructive and reparative. 2nd, animality, eminently destructive and wasting; and through life to death runs this same balance, or partial balance; from infancy to the 35th year the *constructive* is the predominant life; from 35th to 45th there is usually a *balance* of the two lives, and equalization of construction and destruction; but after the 45th the "constructive life begins to decline, the protoplasmic agents generally relax their activity, they build more slowly, they repair more slowly, and after the 70th or 80th year, they seem unwilling to work much longer, and man shrinks up, wastes away, and is not rebuilt, and hence the failure of animal forces as he floats slowly down the ebbing tide of vitality.

But you may ask what of this system working? What of this animality which is not vitality but is so absolutely dependant upon it? I can only say I did not promise to unfold the mysteries of "animal life," but only vegetative life; that undercurrent of life which precedes, determines, defines and measures the extent of the other.

The Practical Application.—There are some very curious applications of the theories above advocated, and yet some

which are of every day occurrence in our practical lives; for if it be true that the protoplasmic activity is dependent upon material and dynamical conditions, which we call food and water, light and heat, then an inadequate supply of either must give decreased or perverted activity of the *builders;* hence a child with deficient food, deficient heat, déficient light, would assuredly sooner or later show evidence of inferior tissue building, if not of really decreased building; the protoplasmic agents having inferior material with which to build, will of course put up inferior structure, and we call this inferior structure a "scrofulous affair."

Again, suppose a man works his brain too severely and too long; suppose he does not take his 6 or 8 hours sleep each night, that the builders may during that time repair the day's waste; what do you expect as the ultimate result? He is burning his brain tissue faster than he is building it, and the end inevitable, the inexorable, is failure of brain force or aberration in its manifestation. Finally the man either *dies* of so-called "softening of the brain," or he glides downwards through the descending scale of irritability, eccentricity, incipient insanity, to fully developed loss of reason. And now the explosions of brain force are erratic, abnormal, irrational and we put him in a special institution called an "asylum," and give him good food and brain rest for 6 months or more, hoping that in that time the *builders* will repair the organ, and remove all traces of the trouble. Sometimes the builders of the lungs fail to do their work properly, and then we have a gradually increasing trouble in those organs, and the Doctor at once stops the man from work, gives him good food, plenty of sun-light and heat, plenty of sleep, and trusts to better building in future.

Cancer.—You have heard it said that "evil communications corrupt good manners;" this is true of the protoplasmic agents also, and we find now and then a species of insubordination, or extremely bad tissue building, beginning first in a localized manner, and then spreading over vast *areas*; take for example the rascally fraud in tissue build-

ing, which we call *cancer*. This is nearly invariably a local mutiny of the builders, and if the knife be freely used, and all of these disaffected agents promptly removed, the thing stops; but if one hesitates, delays, procrastinates for months, the mutiny spreads, and these protoplasmic agents get into the blood vessels, and then travel to other parts, and migrating out of the vessels, set up the same trouble elsewhere; then instead of one, we have many *foci* of trouble, and finally the man's whole system becomes involved and corrupted, and he dies of cancer. Dies because of the migratory habits of these protoplasmic agents, which being corrupted at the primary depot, have carried their acquired bad habits with them on their travels. Sometimes, in fact, in bone cancer, we find them stopping in the lungs, liver and other organs, and quietly building nodules of bone infected by cancer wherever they stop.

If there be a useful lesson to be learned from this essay, and it is "*the absolute necessity of a correct hygiene*, childhood is the period of constructive or protoplasmic activity in its most vigorous form, hence the demand for food, and hence the necessity for light and heat, and also for oxygen to supply the means of burning up the refuse matter. Therefore give your children good rich food, and plenty of air, sun-light, and good clothing. Again, beware of too much brain work in youth; too much schooling keeps the child too quiet, and he fails to get enough of light and oxygen, he therefore builds badly and sooner or later shows flagging. Beware of the cultivation of youthful prodigies, you are simply burning their brains up faster than they are repaired, and your prodigy of 4 or 6 years is the dunce 18 or 20; better first muscular development as a very gradual process. The builders of our body, like the builders of our houses, are only reliable when they work slowly, and rapid building in either case means defective work of uncertain strength and short duration. Therefore when in a case of typhoid fever, typhus fever, erysipelas, diptheria, &c., your physician orders beef tea, cream and rich milk, he at once

assumes that your tissues are wasting faster than the protoplasmic workers can with your ordinary food effect repair; he also assumes that many of the workers have been killed, and yet from this decreased number he requires extra work, and to meet the emergency he furnishes the best of material, and in addition often orders wine and stimulants, which are said not only to arrest tissue destruction, but also to supply encouragement to the builders; and thus he endeavors to preserve enough of tissue to ward off a "collapse of animality" until the stress of the disease is over; and now more than ever recognizing the fact that in the integrity of the builders is the preservation of the structures upon which the evolution of animality so directly hinges.

In conclusion permit me to return in the name of the FACULTY of the College, our thanks for the compliment of your presence to night; and if, as its humble representative, I have succeeded in throwing some light upon the origin of that interesting subject, the "maintenance of life," and preservation of vital force, I shall be most happy to have discharged my duty, first to you in giving the true basis for a correct hygiene, and secondly to them as teachers in a school, which has for its object the preservation of certain organs almost indispensably necessary to a proper preparation of one of the conditions of life, namely—*food.*

ARTICLE II.

Care of Children's Teeth, between the Ages of Six and Fifteen.

BY P. E. WHITE, DAVENPORT, IA.

Read before the Illinois State Dental Society.

We all recognize the vast increase in number of our "little patients" suffering from disease of the dental organs, and, in consequence, one of the practical questions of the hour is—how shall we care for them? I do not propose to enter into the *whys* and *wherefores* of the diseased conditions

of the teeth, but commence where I find my patient, and explain my practice as they come to me daily. The first question that presents itself to me is,—*Should the deciduous teeth receive the same care and attention as the permanent?* I answer, YES. Our creator evidently gives the deciduous teeth as important functional duties to perform as the permanent; and when we glance at the process of nature, and find certain laws in force, with such accuracy that we can determine the time of the eruption of the several teeth, both deciduous and permanent, we certainly ought not to question the goodness of Him who has pronounced all things good, but must acknowledge that all His works were made for a wise purpose, and to perform their particular part in life.

In order then that the question may be answered satisfactorily, let us look at the duty of the temporary teeth; we find that they are erupted at an age, and as rapidly as the system requires more solid nutriment, continuing its work until the full development of the teeth has been obtained; in normal conditions we find incisors, cuspids and molars, properly adapted and in perfect articulation; they are then placed for mastication of food, subduing the solid elements, preparatory to being introduced into the stomach; giving space for the full development of the permanent teeth, and as the process continues and absorption takes place, it is even already contended by some that the elements contained in the deciduous teeth may be appropriated as nutriment in the formation of the permanent. The teeth give the child the use of speech, giving him advantages from the first, of learning right pronunciation, and when erupted at the proper age, oftentimes preventing the lisp which may be caused by a too free escape of sound. They also give a perfect contour of the face, producing symmetry and beauty of the features; in fact they are needed for the *perfect development* of the child.

The premature loss of the deciduous teeth, I think, occasions more injury to the dental organism than the loss of

a permanent tooth after a full development of the maxillas. If then the temporary teeth are of so much importance, can there be but one answer, as to whether they should receive the greatest of care? Is there one among us to-day, but that would most strenuously oppose the unnecessary removal of a permanent tooth, however much it might be affected by disease, but on the contrary, make as earnest efforts in the opposite direction, saving the tooth for its proper function. Just such a stand do I take in regard to retaining the temporary dental organs intact, until by process of nature, the time shall have come for their removal, either naturally or by surgical means. I most certainly believe that the amount of injury being done to our young friends by neglect, through ignorance and wilfulness, is incalculable; and that every effort should be exercised, and all means taken for the preservation of their teeth, is one of the duties of the dentist; at no time in life do I consider that the teeth require the attention and care requisite for their future usefulness, as between the ages of six and fifteen; the great changes that transpire in the dental economy within that time, is simply wonderful, such as no student of nature can witness without exclaiming as did David, "I am fearfully and wonderfully made."

The design of nature was evidently perfect, yet how do we find it in our practice? In this degenerate age, when people do not live over righteously, we find the teeth of the young becoming carious at a fearful rate; and unless we bestir ourselves and give the people a knowledge in regard to the subject, as is our duty, if I mistake not, there will be more mechanical dentistry to perform for the coming generation than has ever been done within the same time previously.

Our young people are coming to us daily for relief, already suffering with painful teeth, from vitiated conditions of the secretions of the mouth, tartar in all its various forms and chemical combinations, inflamed and ulcerated gums, oftentimes attended with a discharge of purulent

matter from around the necks of the teeth—morbid state of the absorbents, these and kindred lesions of first dentition should receive judicious management; above all no tooth should be removed only as a *dernier resort*, but should, if diseased, be treated and filled, that it may occupy in usefulness its allotted position.

The premature extraction of the teeth brings me to the point of *irregularity*. Within the past year I have examined closely mouths of many children and adults, frequently taking casts of such as were particularly interesting in regard to this subject; my observations thus far most certainly lead me to the conclusion that *improper treatment of the temporary teeth*, is as a *rule*, the *primary cause of irregularity of the permanent.*

A case in point:—I have in my possession, a cast taken from the mouth of a young lady aged nineteen, which exhibits the centrals overlapped, the laterals turned one quarter round, with their palatine surfaces pressing hard against the distal surfaces of the centrals—the right cuspid inside the palatine arch, while the left cuspid is outside, lying in almost a horizontal position, pointing toward the mesial line; the first bicuspids are wedged closely to the laterals, occupying the true position of the cuspids, while the molars are in their natural position. Learning the history of the case, I found that at the age of six, the centrals had been erupted, and that the laterals were forcing their way, causing considerable pressure upon the deciduous teeth; applying to a dentist for advice and treatment, he extracted the temporary laterals and *cuspids*, hoping thereby to give plenty of space for the eruption of the coming laterals. He succeeded admirably, as the foregoing description, and a glance at the model will show. The great mistake made, was in removing the cuspids, for had they been allowed to remain until the age or circumstances warranted their extraction, or until sufficient expansion of the maxillas had occurred, I am convinced that no such fearful result would have followed. [NOTE:—I would state that this case was most suc-

cessfully treated by the removal of the second bicuspid on the right side, and the first bicuspid on the left, when by the aid of proper plates and appliances, the teeth assumed a beautiful and symmetrical appearance.]

Says Prof. Garreston :—" If for one moment we refer to certain physiological relations existing between the first and second dentures, we may find that it is within our power to prevent the many ills that follow so frequently in this train, and simply by little or, more commonly, nothing. The deciduous dental arch is filled completely by its ten teeth. The permanent set is to comprise in number, sixteen, and each tooth certainly quite as large again as its predecessor. This increase in number and size of the teeth, it is evident must be provided for in an enlargement of the alveolar arch. This provision is always attempted by nature in the process described by the physiologist as elongatory. * * * *In proportion to the number of deciduous teeth removed prematurely, will be the curtailment in size of that arch, at least of its alveolar face.*"

Much, however, must depend upon the skillful judgment of the operator in directing second dentition, and in order that success for the futnre may be assured, rather than to be hasty in our conclusions, let us wait till we have satisfied ourselves as to what results we are aiming to accomplish, diagnosing the case with care, and never thinking it lowering our professional dignity, by seeking the advice of a brother who perhaps may know more than ourselves.

The above may suffice, perhaps, to introduce the subject of prevention of irregularity of the permanent teeth, and as to how we shall proceed after the irregularity has already been gained, is a question with which we are all familiar; here ingenuity displays itself in the many various modes of treatment, appliances, &c., and where perfection can be gained, often restores mal-formed dentures to usefulness and beauty. I would raise just one objection in the extracting for treatment of irregularity, which to me seems of much importance; of course, judgment must be used in every

case presented, but to me, the practice of some, who extract the first permanent or six-year molar, is exceedingly erroneous, and detrimental to the future formation of the maxillas. I have observed during the past, mouths where the molars have been extracted, where *proper articulation* has been wholly destroyed; in almost every case there has been space sufficient for a bicuspid, that there is no probability of ever being filled, and with the second molars pitching forward at a considerable angle, with its antagonizing tooth merely touching on a small portion of it, if at all; with such cases, had the second bicuspid been removed, there would have been plenty of room to have regulated successfully all the teeth anterior to them, while the antagonism would have remained perfect.

Now as to the general care of the teeth, during the ages I have selected. I find no better treatment than to follow strictly the common laws of hygiene; particularly do I urge upon parents the very great importance, in order that their children may have sound, healthy teeth, free from caries and pain, that there should be perfect cleanliness of the mouth and body, proper clothing, good substantial nutritious food, plenty of free, healthy exercise in the open air, and—rest. Whenever I examine the teeth of a child, I look closely to the condition of the six-year molars, so often mistaken by parents as being the temporary teeth; and should the child's mother be present, I explain to her by charts and models, the great necessity that those teeth should be preserved, while the thanks that I have so often received for so doing have been many, paying me better than any pecuniary consideration.

Recommend and urge to parents that the teeth of their children should be examined often, that they should, when found carious and diseased, be properly treated and filled, never omitting, when the parents or children are anxious to receive instruction on this point, to explain, as far as possible, in a general way, the process of first and second dentition, and the many diseases often attending them. I cannot

better close this paper, than to show how diet and a regularity in life may affect the dental organism, and in fact the whole body.

I have lately been allowed to visit and examine the mouths of the children connected with the Orphan's Home, located near our city, through the courtesy of the superintendent, Mr. S. W. Pierce. Thinking that the natural and regular course of living among the children must exert a marked effect upon the teeth, induced me to make the examination, and the result was far beyond my most sanguine expectations. Here let me give a few statistics. The Home has been organized nearly nine years, during this time, over 1,100 children have been enrolled, largest number at any one time 585; there are now present 180 (the smallest number ever at the Home) boys and girls, whose ages are from five to sixteen years. Of the remarkable health of the institution, I need state but one fact, viz: there has been but *one death* among the children since August, 1869. This is an extraordinary showing, and it would be well for all who are interested in the health of our children, and even of ourselves, to inquire into the reasons why, connected with it. 1st.—The Home is located on a charming spot, grounds elevated, and where plenty of pure fresh air can be obtained, and the sun has free access to all parts of the grounds. 2d.—Strict attention is paid to proper exercise, both of mind and body, and thorough cleanliness of the homes and the inmates enforced. 3rd.—The children are regular and methodical in all their ways, whether in school, at work or play, eating or retiring. 4th—Proper attention is required in regard to the diet, and herein, it seems to me, lies one of the great secrets of success, and one, although we know its truths, yet are so loth to practice. It may not be amiss for me to present to your notice, a list of the articles of diet which is prescribed for the children.

BREAKFAST.

Sunday—Baked beans, brown and white bread and butter.

Monday—Boiled milk, bread and syrup.
Tuesday—Meat stew, bread and syrup.
Wednesday—Baked beans, bread and butter.
Thursday—Boiled milk, bread and syrup.
Friday—Boiled potatoes, bread and butter.
Saturday—Meat stew, bread and syrup.

DINNER.

Sunday—Cold meat, pickles, bread, butter, cheese, apples and pie.

Monday—Vegetable soup, cold slaw, corn bread, butter and apples.

Tuesday—Potato soup, pickles, rice and syrup.
Wednesday—Hash, onions, bread, butter and apples.
Thursday—Noodle soup, baked potatoes, bread and butter
Friday—Bean soup, rice, or hominy, apples and syrup.
Saturday—Hash, onions, bread and butter,

SUPPER.

Sunday—Luncheon of cake and fruit.
Monday—Bread and butter or syrup.
Tuesday—Bread and milk and gingerbread.
Wednesday—Mush and milk.
Thursday—Corn bread and butter or syrup.
Friday—Rusk, bread and milk, and gingerbread.
Saturday—Bread and milk.

Other fruits and vegetables in their season. Drinks—milk and water.

Upon a diet like this, for seven or eight years, and with the regulations required, our theory would be that the dental organism would, or ought to be perfect. Now as to facts,—to my great surprise, knowing the average condition of the teeth of children in the city, in the large number of oral cavities examined, I did not find but three or four temporary teeth at all carious. I found the process of first and second dentition taking about its ordinary course as to time of eruption, yet, if anything, second dentition was retarded somewhat, owing to the extremely firm and solid material

contained in the temporary teeth. In my further observation, I found but two or three of the permanent teeth at all decayed, excepting in one little girl of a scrofulous or syphilitic diathesis, who had been in the home only two years when the six-year molars were carious to quite an extent, the crowns to three of the teeth being entirely gone.

The cuspids, bicuspids and second molars of those examined, and especially of those who had been in the Home for six or seven years, were most beautiful, exhibiting that strong, healthy texture in appearance, that indicates perfect development of the tooth structure.

I learned that the children seldom, if ever, used a brush or pick upon the teeth, and yet salivary calculus was not present to any great extent, except in a few who were suffering from hereditary or constitutional disease; but this —uncleanliness of the mouth and teeth—was the only thing to mar the beauty of the whole; otherwise, picture to yourselves how teeth, and in fact the children themselves should look, living under such a regimen, and you have it full exemplified in the children now at the Orphan's Home. Much credit must be due the superintendent, matron, and assistants, for the thorough manner in which the common hygienic laws are observed, in the valuable institution over which they have charge.

The lessons that I have learned myself, from my visit to the Home, have been many and valuable; and perhaps the greatest is,—if I would wish to live long, and free from the many ills and sufferings of life, proper and strict attention should be given to exercise, cleanliness, diet and rest.

ARTICLE III.

The Use of Alcohol in Medical Practice.—Concluded.

BY JOHN MORRIS, M. D., OF BALTIMORE.

A report read before the Medical and Chirurgical Faculty of Maryland.

Surgeon General Maclean, of the British army, in a recent article on this subject is most sweeping in his condemnation of the use of alcohol in the army.

He says: "If there be any point of military hygiene that now may be regarded as settled beyond doubt or cavil it is this, that spirits are not only not helpful, but are hurtful to the marching soldier everywhere, but nowhere more so than in hot climates. The evidence shows that wherever soldiers, by accident or design, have been cut off from the use of spirits on marches, in active service, in temperate climates exposed to wet and cold, or in tropics to ardent heat, or in laborious sieges, they have maintained their health, spirits, discipline, far better than when the once deemed indispensible grog was in daily use."

His colleague in the military school, Doctor Parkes, and the late Count Wallowicz, in a series of careful experiments on the use of alcohol, carried on at Netley, have placed on a sure scientific basis what was before a matter of observation, and have established that alcohol, far from increasing the power of bearing fatigue, even when given in a quantity which many spirit drinkers would deem within the limits of moderation, lessens muscular force, and a quantity in excess of this, it was shown, entirely destroyed the power of work.

Doctor Maclean further says: "I cannot leave this important subject without adding that for twelve years I have at Netley had unrivalled opportunities of studying the effects of habitual dram-drinking on the persons of our soldiers, and I add my testimony to the immense weight of evidence accumulated by medical men in civil and military life, to the effect that alcohol is one of the most active agents in causing the degeneration of the human tissues—in other words disease, premature decay and death."

The conclusions of Dr. Parkes and Count Wallowicz, before alluded to are thus stated. The effects on appetite and on circulation are the practical points to seize, and if we are correct in our inferences, the commencement of narcotism marks the point when both appetite and circulation begin to be damaged. As to the metamorphosis of nitrogenous tissues, or to animal heat, it seems improbable that alcohol in quantities that can be properly used in diet has

any effect. It appears to us unlikely (in the face of the chemical results) that it can enable the body to form more work on less food, though, by quickening a failing heart, it may enable work to be done which otherwise could not be done. It may then act like a spur in the side of the horse, eliciting force, though not supplying it.

Even Dr. Dupre, a most earnest supporter of Dr. Austie's views, only *assumes* that it is food. He says: "On consideration it will be found that the observed diminution of urea following the consumption of alcohol is strong evidence in favor of the assumption that alcohol is a food, and that to a certain extent, as far as the production of force, for example, is concerned, it is really capable of taking the place of food, and therefore protecting the tissues from the wear and tear of life."

The advantages of abstinence from alcohol during exposure to cold is a most striking fact. A group of men, twenty-six in number, travelling over the Plains, lost their way and were overtaken by darkness. The weather was intensely cold, and only three of the twenty-six abstained from alcohol. Dr. McKinley, who accompanied the expedition, tells the fate of the party in a few words, in a communication to a Cincinnati medical journal: Those that got drunk, froze dead, those that drank less, but too much, died after a while; those who drank only moderately, will feel it as long as they live; out of the twenty-six only the three survived who abstained from alcohol. All were equally well provided, each having two blankets. All were in the bloom of life, and the best of health, and ready to encounter and able to overcome the hardships inseparable from a frontier life. This only confirms the views of all travellers, including such Arctic explorers as Ross, Richardson, Franklin, Kane, Hayes, etc. Indeed, the Hudson Bay Company prohibit the use of alcohol by all persons in its employ. From these facts it may clearly be inferred that alcohol is not only not a food, but a poison—a poison as much as opium, and should be administered with the same caution, and sold in the same manner and under the same legal restraints.

Dr. Forbes Winslow, whose valuable life has just been lost to the profession, in his testimony before the parliamentary committee, says: "Alcohol is not a necessary of life. It should be dealt with by the legislature as a poison. A person goes into a dram shop and takes his rum or whiskey; he imbibes a poison. After a time his nervous system becomes saturated with it, and the brain itself becomes surcharged with alcohol, and, as is the case very often with chronic drunkards, on examination after death, if you apply a light to the venticles of the brain, it ignites into a flame. You can actually distil alcohol from the brain of chronic drunkards; the brain is so saturated with the spirit, and, of course, the whole source of vitality becomes poisoned."

The two next questions: Is alcohol necessary in the treatment of disease, and is the good it works at all equal to the injury it produces? are now to be considered. For our own part, we do not deem alcohol absolutely necessary as a means of cure. It can be supplemented by other agents, simple and inocuous. The ethers can be employed in many cases in which alcohol is now administered, and with equal efficacy. Their use involves no liability of the habit of taking them being created, for as much as they are nauseous and unpleasant, and could scarcely come into common use as a stimulant. Milk is a far better remedy in typhoid fever, and, in connection with raw beef, is much superior in the treatment of all wasting diseases. Digitalis, bromide of potassium, quinine, more than fill its place in heart troubles, and affections of the nervous system. For fatigue and nerve enervation, coffee, as we before stated, is above all our best and most reliable agent. It is admitted even by those who contend for the use of alcohol in fevers, that there are subjects to whom it is injurious—patients in whom the secondary digestive process within the blood is slowly performed. The nervous depression induced by this condition, it is conceded, more than counterbalances any nutritive advantage it may possibly possess. It may then fairly be presumed that there are few cases of disease in which alcohol cannot

be supplanted by some other remedy within our reach. The good that it may possibly effect in a few forms of disease, cannot be used as a set-off to the incalculable amount of physical degeneration produced by its use, independent of the moral consequences, which it is not the purpose of this paper to discuss.

Now let us consider how far medical men are responsible for its use as a dietetic agent. We must not be understood to assert that any great part of the intemperance of the day is due to the medical profession; indeed, we feel convinced that the cases are very few in which drunkenness has occurred from the inconsiderate prescription of alcohol. Above all have we no patience with those disingenous and cowardly persons, particularly clergymen, who attribute their intemperate habits to the prescription of stimulants. It is due to the truth, however, to state, that so great an authority as the *Lancet* admits that in some instances this is the case in England, particularly among the higher classes of women.

A great deal of harm has been done we are convinced by the mere fact of calling alcohol a stimulant. It is not a stimulant in the true sense of the term. as we have already shown. The popular mind, however, has been taught to believe that it is, and men and women rush to it in the firm persuasion that its powers are beneficent and life-sustaining, who would avoid its use did they know that it depresses all the vital forces, and tends to general and permanent enfeeblement; and that it only has the power to evoke the will to performance without conferring the necessary strength. This fact is demonstrated in the modern treatment of delirium tremens. Under the old system the gradual method was adopted, and the patient and his friends were induced to believe that the sudden withdrawal of alcohol would inevitably lead to fatal consequences, that is: That a patient already feeble and prostrate was to be still further subjected to the influence of the agent, which had been the cause of all his suffering. By the modern plan, in

which alcohol is totally prohibited, a patient recovers in one-half or even one-third of the time, without the progress of his case being marked by those painful and melancholy symptoms which attended the old method. Food administered frequently and in small quantities, is, in fact, the only proper remedy for chronic alcoholism; it arrests degeneration of nerve tissue, and also relieves the intense sinking and craving for stimulants so generally experienced by drinkers.

Debility, as we before stated, and anœmia are ever before the eyes of certain practitioners, and serve as an excuse for alcoholic medication, and these terms, we are sorry to say, are frequently used to hide a great deal of ignorance.

The *Lancet* is very severe on this class of medical men. It declares its belief that all the mischief in the administration of alcohol in chronic disease is due to the unthinking and illogical prescription of it for debility, merely as such. It adds: "It is no figure of speech, but the literal truth, when we say that hundreds of neuralgic, hysteric and epileptic patients have been driven into drunkenness or lunacy, or both, by the careless folly of advisers, who had no better reason for the prescription of alcohol than the fact that these diseases are attended with nervous weakness, as they undoubtedly are. The assumption involved—that so much ingested alcohol is necessarily so much added nervous strength—is so gross a fallacy that no one would assent to it if expressed in plain words. Yet we constantly see it acted upon. We repeat, with all the energy of which we are capable, that it is a grave scandal and mischief that medical men should endanger in this serious way the powers of moral resistance, of women and other weak persons, while basing their practice upon ideas that are illogical and untenable, and we trust that a reform in this respect will be immediately commenced.

Be this as it may, we believe medical men have it in their power to do much to restrain the use of alcohol. The public believe that it is a necessary article of diet: that it is

highly nutritious and strengthening, and that if actual drunkenness does not supervene from its use it cannot be taken too freely—this is the great error which it is our office and duty to correct. Doctor Anstie's investigations fix one and a half ounces of absolute alcohol, that is, three ounces of proof spirits as the quantity that an adult can take daily without actual injury. Dr. Parke's experiments proved that two ounces affected a strong, healthy soldier, with what may be fairly called symptoms of poisoning.

The safe rule in using alcoholic liquors, then, may be laid down as a safe rule for the guidance of the people, that one and a half pint of ale, containing five per cent. of alcohol, or a pint of claret or other light wine, containing ten per cent., is the exact amount that may be taken for dietetic use without detriment. Let the public, then, be taught, through us, that every drop taken beyond this is poisonous; that every drop taken beyond this is destructive of life force; that every drop taken in excess of this tends to enervation of mind and body, and if continuously taken, will lead to premature decay and death. This kind of teaching the community requires. It may not make men tee-totalers, but it will tend to make them temperate. There is no disagreement in our profession concerning the action of alcohol on the heart, stomach, nerves or other organs, and it is on these points particularly that the people most need enlightenment. It is not necessary for medical men to ally themselves with any party on this subject either in religion or politics, because by doing so they may lessen their influence as public teachers; but it is their solemn duty to enforce habits of temperance, and to lay down such rules for the guidance of their patients in the matter of diet as will secure their health and happiness. The whole subject rightly belongs to them, and it is only to them that proper reforms can be instituted or enforced, and the sooner this is discovered, both in Church and State, the better will it be for mankind, and the sooner may we hope to see a true advance made in the civilization of the age.

The paper by Dr. Morris was warmly applauded.

ARTICLE IV.

American Dental Convention.

Mr. Editor—*Dear Sir.*—Permit me, through the medium of your influential journal, to call the attention of its readers to the meeting of the American Dental Convention, which holds its 20th annual session at Saratoga, on the 11th of August.

This organization has done much towards the elevation of our profession. Established upon democratic principles, its doors are open to all reputable practicing dentists.

If a tree is known and appreciated by its fruits, surely this Convention should occupy a prominent position in the dental world, numbering as it does among its members, many of the brightest intellects in our ranks.

The friends of the Convention anticipate a large attendance at its coming session. Dr. T. W. Evans, of Paris, is expected to deliver the opening address, and many of the most prominent and influential members of the profession will be in attendance, read papers and participate in the discussions, &c.

The Transactions for the three past years are now in press, and will be ready for distribution at, or before the time of meeting.

A cordial invitation is extended to every practicing dentist who feels interested in, and desires the advancement of dental science and knowledge, to be present and contribute his mite towards that end, and assist in pushing on the wheels of progress, and thus keep pace with the times and other specialties of Medicine and Surgery.

Let all who love our profession and its advancement be sure to be there.

J. G. AMBLER.

SELECTED ARTICLES.

ARTICLE V.

Abnormal Mucous Membrane.

BY DR. S. B. TIZZARD.

The diseases affecting the soft tissues of the oral cavity are of a character of great importance to us as dentists in the practice of the profession; for on their well being depends in a great measure the success of most of our operations.

The mucous membrane of the mouth seems to be more subject to the action of morbid influences in early life than during any other period, in consequence, possibly, of the many and rapid changes constantly taking place in the tissues at that time; because of the eruption of the temporary teeth and also in consequence of the greater susceptibility of the constitution to general organic disease. It is not confined to early childhood alone, or during the periods of teething; but it affects children of all ages, taking different forms and producing different results in one case from another, owing to the health, habit and circumstances by which the child may be surrounded at the period of the attack.

The affection of the mucous membrane of the mouth most common at this time of life is termed stomatitis or inflammation. It is indicated in some cases, first, by simply an increased redness of the surface of the membrane unattended by any swelling; in other cases it affects not only the mucous membrane but the adjacent parts, as, for instance, the submaxillary, sublingual and also the glands of the neck, causing extreme swelling and pain, though not of an intense

character, unless deep seated in the tissues. In certain stages of the general health and constitution, there is a very great tendency to an ulcerative condition at times, attended with very serious consequences. During the condition, the saliva sometimes flows copiously; at others, the mouth seems dry and clammy, attended by a coated or furred tongue, through which covering little inflamed papillæ may be seen projecting. There is also a loss or vitiated condition of the taste, attended by difficulty during mastication and deglutition.

Simple, or erythematic stomatitis is very general at an early age, sometimes affecting the tongue alone, and, again, by reddened patches slightly raised and separated from each other, on the membrane, but gradually uniting, finally covering the whole cavity of the mouth.

It may be caused by gastric irritation, also by stimulating food; the most frequent constitutional causes are febril diseases. In treating stomatitis the remedies usually employed are very simple, consisting of mild laxative medicines, as vichy salts, magnesia, etc., and soothing mouth-wash of borax, honey or tolu. If the patient be a babe under treatment, being raised by hand, Dr. Tomes recommends the addition of a little lime water to the milk given it.

Another disease of this membrane common to infants is called thrush or apthæ, consisting of small white or grayish colored ulcers situated on the tongue, inside of the mouth, and frequently extending to the throat and fauces.

It is caused by lack of food containing proper nourishment and by irritation of the bowels. It is usually attended with diarrhœa, though at first the bowels may be costive. It is seldom dangerous, and in treating it the disordered state of the bowels must be removed by using ant. acid and astringent medicines, the general system being toned up by the proper administration of a tonic, as cod-liver oil or iron, with mouth-wash consisting of a dilute solution of borax, applying at the same time crystal carbolic acid to the ulcers themselves.

Ulcerative stomatitis, a disease to which our attention is often called, occurs in the anterior part of the mouth, except in very rare instances, and most frequently it commences at the labial margins of the gums of the inferior incisor teeth. They first become congested, inflamed and swollen, bleeding at the slightest touch. Unless attended at once, the gums rapidly become detached from the teeth, exposing their necks and also laying bare the alveolar processes beneath. This is frequently the case with children of poor people living in large cities in poorly-ventilated tenement houses, where, in consequence of neglect or ignorance, attention has not been called to the disease until it has become deep seated ; in such cases the affection will not only cause the loss of the teeth, but even the alveolar process itself may become diseased and act as an irritating agent in aggravating the disease. The cheek or lip also, in contact with the affected part when the ulcers are extensive and the blood impure, become subject to very near the same condition, probably in consequence of some of the fungi becoming attached or transplanted from the ulcers to the membrane, which lacking vitality in con sequence of this impoverished condition of the blood to resist the destructive influence, readily falls beneath the acrid irritating action of this agent of disorganization.

The exact causes are not wholly either of a local or a constitutional character ; it may result from a disordered condition of the ailmentary canal, and, again, in persons subject to diseases of this character, it may develope itself from any slight irritation of the tissues of the mouth.

In its treatment, should there be any constitutional trouble, proper remedies must be given for its removal. In cases of this nature, local applications alone can do but little good except to slightly ameliorate the symptoms until the irritating cause be removed. For this purpose, rinsing the mouth with a solution of alum, lime water and borax, also chloride of zinc applied by penciling the part, will be found beneficial, as will also the presentation of chlorate of potash ; for an infant one year old, 5 grains ought to be given every 4

to 6 hours owing to severity of symptoms; for an adult, a tea-spoonful three times a day; for a child 3 or 4 years old, about three grains, taken in sugar; for a child from that age to ten, about a full dose, or 10 grains every three hours. If the bowels are at all costive, they should be moved by some gentle aperient. I have found vichy salts, as stated before, to be most excellent: for a child 4 or five years old, a half tea-spoonful of the salt in a table-spoon of sweetened water; for an adult, two tea-spoonfuls in a small half tumbler of water prepared as above mentioned. In case the patient should be of a syphilitic diathesis, so constitutionally predisposed to this trouble, the administration of the iodide of potash—if an infant, ½ gr.; if a child from 2 to 4, 2 gr.; if an adult, 5 gr.—once in 6 hours will be found of very great benefit. Crystal carbolic acid applied to the ulcers will be found very beneficial in promoting healthy granulations. In case the ulceration has extended to the cheek, it will be best to place a small pledget of cotton between the gum and cheek, with a dressing of dilute carbolic acid glycerine to prevent adhesion. Should the trouble be of a strictly local character, it may readily be relieved by the removal of the irritant, whatever that may be, followed by a detergent and stimulant wash.

Another disease to which this membrane is liable among infants, but one that happily is of rare occurrence, is termed gangrenous stomatitis. It is met with among children from 2 to 8, but most commonly in infants from 2 to 4 that have been surrounded by about the same conditions as were described among the exciting causes of ulcerative stomatitis. Children predisposed to it are of the lymphatic temperament; debilitated constitutions; pale, flabby skin; and weak digestive organs where the functions of nutrition are but imperfectly performed.

Among the first symptoms usually noticed, predictive of this disease, is an inflamed condition of the gums, followed by general helplessness, peevishness, loss of sleep and appetite, with inordinate thirst; the skin becomes pale, counte-

nance sad, and there is a singular puckering about the corners of the mouth. These symptoms last but a few days, and again for weeks, before the disease becomes fully developed; when this is the case, the face begins to swell rapidily, the skin shining, glossy and very hard, painless to the touch and having in its centre a splotchy-looking red spot.

Much, we might say everything, depends upon the time the treatment is begun, if a cure is effected. The one great reason why this disease is so frightfully fatal, is the fact that, being, as it is, almost wholly devoid of attendant pain, it attains such an intensely malignant character before being noticed, that it is impossible to eradicate its destructive influence.

The treatment of this frightful malady, if gangrene has actually begun, consists in the destruction or eradication of the diseased portion by the use of strong caustics, such as nitrate of silver, fumes of nitric acid; followed locally by a detergent and cleansing mouth-wash; as, chlo. zn. solution, 10 gr. to pint of water; liquor chlorinaten soda, Labaraque solution, 1 ʒ to 3 ℥ of water; also a solution of permanganate of potash, 1 to 6 ʒ to pint of water; and in administering internally milk, strong beef-tea, cod liver, and also by tonics of iron to strengthen the general system.

However, much more may be done towards preventing the occurrence of the disease, by change from an impure to a pure atmosphere; good, healthy diet; cleanliness, and by proper attention given to toning up the system, than curing the disease after it has once become fully developed.

Among other diseases to which this membrane is subject, is that termed mercurial stomatitis, or active inflammation. Usually the first indication of the presence of this disease is a peculiarly disagreeable fetor of the breath, followed by a metallic or coppery taste, with an increased flow of saliva. The margins of the gums of the inferior incisor teeth first become inflamed and slightly swollen; the redness rapidly extends over the whole membrane until the mouth is more

or less diseased, owing to the amount of the drug presented. These symptoms are followed by an uneasy feeling about the gums, a little above the free margins of which a white line may be seen; the teeth become sensitive to pressure, often aching; the saliva flowing incessantly; the muscles of the jaw stiff and painful, frequently to such an extent that it is impossible to open the mouth, masticate and swallow; arrived at this stage, the odor of the breath, before bad, becomes intolerable; ulceration sets in, commencing around the necks of the teeth, which in consequence become loosened, also affecting the lips, cheeks and fauces. Severe cases are frequently attended by profuse hemorrhage, sloughing of the tissues, also by fever, sometimes symptomatic, and again induced by the administration of mercury. Fatal results have occasionally occurred in consequence of the debilitating effects of irritation on the constitution, hemorrhage and lack of proper sustenance; though persons usually recover after very severe attacks, though not without more or less deformity of the mouth.

In ordinary salivation, the most that will be necessary to do will be to discontinue the use of the mercury. In case the gums still continue swollen, soft and spongy, a milk diet should be prescribed, a mild laxative given, followed by the presentation of potassa chloras of 8 to 10 gr. in ℥ ss of water—tea-spoonful 3 or 4 times a day; same also used as a soothing mouth-wash, of the strength of a tea-spoon to an ounce of water. It will be found very useful in allaying the inflammation in case the chlo. potash should not act readily. Iodide of potash, given in doses of 3 to 5 gr. three times a day, will be found beneficial. If any of the teeth should have become loosened, and astringent wash will be indicated; bleeding the gums will also be found useful in assisting to restore them to health. In removing the fetor of the breath a wash of phenol sodique, or chlorinated soda, in proportion of 1 to 2 tea-spoonfuls to a tumbler of water, will be found excellent.

The last morbid condition of this tissue and the gums to

which we shall call your attention is that of chronic inflammation—a disease rarely attacking persons, so that it may be noticed, before arriving at the age of 34 or 35, or until middle life. It is very insidious in its encroachment on the tissues of the mouth, and is usually the most difficult to cure of any of the diseases to which our attention may be called. In its first advances there will be noticed a slightly blunted and thickened condition of the free margin of the gum, attended by a soft, white, cheesy exhalation, seemingly thrown from the tissues; also a lack of that greatly increased redness which usually characterizes inflammation of this tissue, except in occasional cases, where it may range from a light pink to a purple color. The membrane covering the surface of the gum, instead of being smooth, presents the appearance of being drawn over a surface on which are strewn little round balls of some substance, giving it a peculiar roughness that when once seen is always easily recognized as a symptom of the occurrence of this disease. It is apt, when of a constitutional nature, to affect all the teeth alike; though cases of this character are of somewhat rare occurrence. In its usual form it attacks but two or three teeth, often but one. The teeth that in my practice it has seemed most prone to attack have been the superior incisors and also the first molar teeth of the upper jaw. This may seem somewhat strange, as our attention is so frequently called to the fact that the lower incisors, when neglected, so often become loose; but I have found in almost, if not in every case, that this may be directly traced to the pernicious influence caused by the deposition of salivary calculus. When but one tooth (usually an incisor) is affected, the disease may be termed local, and is seldom attended by any pain or inconvenience, except that of increased length, which, from its exposed situation, makes it very apparent and, to many, a source of great annoyance on that account. In the more advanced stage of the disease, where several teeth, regardless of there being perfect or decayed, are attacked, there is a slight discharge of yellow, purulent matter from between

the gums and necks of the teeth, very apparent on pressure. This condition is sometimes unattended by pain; again, the teeth are sensitive to the pressure of the teeth during mastication, and the jaws or part affected becomes the seat of great continued, or *again*, of intermittent pain, at times neuralgic in its nature. If the disease is allowed to pursue its course unchecked, the matter becomes very offensive and profuse, the breath fetid; not only the teeth, but the alveolus itself may become diseased, attended by extensive absorption; following which, the teeth become so loose as to drop out in consequence of their complete disconnection from the dental periosteum by which they were enveloped. It frequently happens that, in consequence of the removal of periosteum from the body of the root, that small particles of tartar may be deposited on the exposed surface, which in turn excites no little irritation, and no doubt aggravates, though it is not the cause of the disease. In some persons where there is a predisposition to periosteal inflammation, it may be caused locally by the presence of any irritant, no matter how slight; such as the sharp edge of an old root or fang, by the rough edge of a filling, or by any other agent that will excite, and by its presence keep up a morbid irritation. Again, among the constitutional causes may be mentioned mercurial poisoning, chronic dyspepsia or any systematic disease which may increase the liability of the mucous membrane and gums to morbid influence.

In the treatment, a proper diagnosis as to whether it is of a constitutional or local character must first be made; all local irritants be thoroughly removed, such as tartar, decayed or badly diseased teeth, roots or any agent whatever that may be productive of irritation. If the gums be congested, free lancing should be resorted to, followed by some tonic astringent mouth-wash, such as krameria, full strength. I have also found topical applications of iodine, tr. of capsicum, beneficial; and also, after thoroughly cleansing the root or part affected, the most efficient remedy that I have yet used has been deliquescent salt, chloride of zinc, by pass-

ing a broach around which was wrapped a few fibers of cotton, saturated, up underneath the loosened portion as far as it would go, and passing completely around the tooth. I have also used a pointed piece of wood for this purpose, and found it to work well. In removing the fetor carbolic acid will be very useful, as will also phenol sodique and liquor chlorinated soda applied in the same manner. To correct the breath, prepare the two last named as for use in mercurial stomatitis.

If syphilitic in character, 5 gr. iodide of potash may be given three times daily, using at the same time local treatment; if it should be caused by dyspepsia, proper attention should be given to restoring the stomach to health by tonics, exercise and proper diet.—*Dental Register.*

ARTICLE VI.

Separating Teeth.

BY W. G. A. BONWELL, D. D. S.

The use of the diamond in the permanent separation of the incisors, superior and inferior, and the hard rubber corundum disks for the bicuspids and molars, will now form the subject of greatest vital importance.

To restore to nature by art that which has been lost, and as in the teeth, the members made useful for a longer period, is a task of which any of us may feel proud. But, to anticipate the tooth of time and make restoration unnecessary is by far a prouder task, and when performed, will elevate the profession to a much higher standard.

What are we doing to day to rid the world of the ravage of decay in the human teeth? Have we done one thing to stay its progress? Are we doing for our patient all that we are conscious is our duty in lessening the great number of fillings, and the greater number of artificial dentures? I say in all good faith, no! no!

Many have, on a small scale, so acted, but the means

hitherto at our hands have been inadequate to the end. It is my pleasure to demonstrate to you to-day that we have at our doors the coveted instruments whereby we can say to that insidious sapper, "thus far shalt thou go and no farther."

The old way of separating teeth, by file and chisel, was bad enough to practice when actually demanded, where decay was present, and *filling* necessary; but to use them on the approximal surface of every tooth to anticipate decay, was too barbarcos. But few would permit it. As a fixed practice it could not be done, and when done could not be fully relied upon from the impossibility of separating sufficiently at the cervical walls, and even when done, of placing such a smooth surface thereon as would prevent decay without constant attention.

What have been the steps taken to take the place of the file and chisel? I think I am safe in saying that the first disk ever given to the profession was a steel file of one inch diameter, recommended to those who bought my drill, the first foot-engine in the market, though not the first patented. Upon this Dr. Arthur's shellac and corundum disks came forth, which, if there were nothing more permanent, are nearly all that we could desire.

When hard rubber plates first came out I made of rubber and emory, separating files, instead of steel, whereby I could cut tooth substances or dress up fillings. For want of proper means of mixing rubber and emory I abandoned it. This old idea is now reproduced, and this disk which I show you, has been the result. With these it becomes an easy and inexpensive task to separate every back tooth, and so perfectly that decay can be anticipated on every approximal surface, if done as soon as the permanent teeth have arranged themselves in the arch. Do not wait a day; for delays are dangerous. The pain is comparatively nothing, and the inconvenience to the patient is of no consideration. The hardest teeth can be separated in three minutes. Their great strength, with their thinness and delicacy, are as ten

to one to shellac, and no fear need be entertained of doing injury to the mouth when run at 4,000 revolutions per minute. It is the work of but a few moments in removing decay where superficial, or, which is better still, to separate before decay has begun. Every one knows that at least ninety per cent. of the cases coming under their care, every approximal surface, or nearly all, have to be filled by the time they arrive at the age of thirty. The majority sooner.

When separated while the tooth structure is yet sound the division is not wide, and such a solid shoulder or abutment can be left that not only prevents any closer approach, but is never a source of annoyance to the patient as when left to decay and then fill, and in quite every case no solid cervix is left to bear the pressure. By this means we can prevent every approximal surface from further decay, and save immensely in every way to the public.

But the disk will not separate more than the bicusps and molars. What have we for completing the arch? I present to you to day the diamond pointed reamer, with a permanent steel back-action for the specific purpose of separating from the palatal side of the superiors, and lingual side of inferior incisors all their proximal surfaces. The superiors I separate whether decay is present or not. The inferiors never, unless decay is present.

The operation is done entirely from the inside of the mouth, and such a groove is made in the short space of five minutes, as not only removes all predisposition to caries, but the division is not seen from the labial surface other than a mere trifle. The entire beauty of the tooth is preserved without any danger from future decay. The most perfect division is made that is possible for any other point to make but that made by a three or five angled diamond pyramid point. It is the thing for a specfiic purpose, and with its conscientious use, with that of the hard rubber corundum disk, there need not be an artificial denture from caries alone. If we wait a wider division, one or more fillings are required, and probably refilling in a few years, with all the annoyance of food pressing upon the gums.

My plan is to commence with children at three years of age, or as soon as the temporary are in place, and separate every proximal surface with the disk, front and all, except the inferior incisors. Sometimes use the diamond reamer, on front teeth. Principally the disk for children, Do not wait until the first permanent molars appear. It is too late to do so perfectly. Then by filling the grinding surfaces, as well as any other places that could not be cut out, we are sure of their temporary teeth. When the permanent take their place I at once make the disk and diamond reamer do their work.

My experience of twenty years confirms me in the assurance that I am performing a more noble and lasting work than by waiting, and having to restore by filling. No one can deny the facts that every day stare us in the face, that if we would have the greatest number of human teeth preserved we must resort to this wholesale treatment. The experience of the old dentists confirms me that I am right, and not a day passes but I see the wisdom of such a policy. In some cases it seemed almost like sacrilege to cut beautiful teeth, but in scores of cases, where I least suspected decay being present, I have found it deeply seated. By no other means could it have been detected.

I have yet to regret the first case where this simple treatment has been maintained. I repeat, instead of waiting for the first molars to appear, commence by dividing every temporary tooth, except inferior incisors, and you have done the best work, that of anticipation. By all means preserve the deciduous by dividing and filling with even ordinary tin foil when needed. Until these means were at my hands I would not have undertaken such Herculean labor, nor would I have subjected my patients to the pain incident thereto, but with these it is but the work of a moment, and a labor that not only pays the patient but the operator, and endows a clean conscience that preservation is nobler than restoration.—*Proceedings of Harris Dental Association.*

ARTICLE VII.

The Causes of Decay of Teeth.

It has been charged against our brethren of the dental specialty that they are wofully at fault in regard to knowledge of the commonest of all things—caries of the teeth. That they extract teeth with skill, and stop them with even more skill, and in a nobly conservative spirit is admitted; but the causes of decay in the teeth have remained obscure.

The investigations of Leber and Rottenstein into this subject have at least the charm of pointing to definite conclusions. We have read their work, in the form of an American translation by Dr. Thomas H. Chandler, D. M. D., Professor of Mechanical Dentistry in the Dental School of Harvard University, and published by Trubner. They admit, of course, that there are differences of teeth, constitutional and connected with race, making teeth more or less resistant to the great influences which determine decay. These are not, according to these authors, internal or vital so much as external and chemical. The process of decay begins from the surface, and if it can be controlled or arrested at the surface it is entirely controlled.

The great causes of caries are two—viz., acids and a certain fungus found abundantly in the mouth, the *Leptothrix buccalis*. This latter agent is characterised by certain microscopic appearances, and by its reaction with iodine and acids, which give to the elements of leptothrix a beautiful violet tinge. Under the microscope, the fungus appears as a grey, finely granular mass or matrix, with filaments delicate and stiff, which erect themselves above the surface of this granular substance so as to resemble an uneven turf. The fungus attains its greatest size in the interstices of the teeth.

No one can deny, nowadays, the action of acids on the teeth—even weak acids—in dissolving the salts of the

enamel and the dentine. All acids, both mineral and vegetable, act promptly on the teeth. Various experiments as to the action of acids on dental tissues are given, making the enamel, naturally transparent, first white, opaque, and milky, and, in a more advanced state, chalky, and then the dentine more transparent, and softer, so as to be cut with a knife. The acids which may naturally effect the first changes in the production of caries are such as are taken with food, or in medicines, or such as are formed in the mouth itself by some abnormality in our secretions, which should be alkaline, or by an acid fermentation of particles of food.

But acids alone will not account for all the phenomena of caries in the teeth. They play a primary and principal part, making the teeth porous and soft. In this state, the tissues having lost their normal consistency, fungi penetrate both the canaliculi of the enamel and of the dentine, and by their proliferation, produce softening and destructive effects much more rapid than the action of acids alone is able to accomplish. It is not pleasant to think that fungi exists in the mouths of all but the very cleanest people. Bowditch, in examining forty persons of different professions, and living different kinds of life, found, in almost all, vegetable and animal parasites. The parasites were numerous in proportion to the neglect of cleanliness. The means ordinarily employed to clean the teeth had no effect on the parasites, whilst soapy water appeared to destroy them.

If this be a true version of the causes of caries—the action of acids, supplemented by the action of fungi—then it follows that the great means of preserving teeth is to preserve the most scrupulous cleanliness of the mouth and teeth, and to give to the rinsing liquids a slightly alkaline character, which is done by the admixture of a little soap. This is not so pleasant a dentrifice as some, but it is effective and scientific.

Acids not only dissolve the salts of the teeth, but favor the increase of the fungi of the mouth. No increase of

fungi and no action on the dental tissues occurs in solutions slightly alkaline, such as a weak solution of soap

The good effects of stopping teeth, in the light of these experiments, are intelligible. The penetration of acids and fungi is prevented.—*London Lancet.*

ARTICLE VIII.

New Operation for Cleft in the Hard Palate.

The following is Sir Wm. Fergusson's operation: —

The first steps of this operation are somewhat similar to the old operation for closing the cleft in the hard palate, namely, paring the edges of the cleft, and making an incision down to the bone, parallel to, and about a quarter of an inch from, the edge of the cleft on either side, the point of the knife being carried back just as far as the junction between the hard and soft palate. Into these incisions a chisel half an inch broad is inserted, and its edge directed against the posterior margin of the hard palate, and made to cut from behind forward, thus partly detaching a slice of bone on each side, with the soft tissues and periosteum attached to their upper and lower surfaces. The result of this is that the sides of the cleft fall easily together, leaving a small aperture through the bone on either side. One, two, or, if the fissure be long, three stitches are passed through the lateral clefts by means of an ordinary aneurism-needle, and thus encircle the detached portions of bone and soft tissue, each suture passing through into the nasal cavity. It should be noted that there is no tension on the flaps, the threads merely keeping the parts steadily in contact. The amount of pain and constitutional disturbance is much less marked in the patients that have been treated in this way than when the old operation of dissecting up the soft parts from the bone has been resorted to.

From the liability of the flaps to twist in slightly, and from the thinness of the edge, Sir William Fergusson is

careful to pare the sides somewhat obliquely, in order to present wider raw surface for adhesion. The sutures, which are kept in much longer than in the ordinary operation, cause no harmful irritation. The lateral clefts become filled up by new bone, which is rapidly thrown out, and tends to keep the parts firmly united in the median line.

The first case in which the operation was performed was that of a girl aged eighteen, whose soft palate had been closed two years ago, and whose hard palate had been operated on by the old method three times, but unsuccessfully, except that the gap was somewhat lessened in size. Before the operation by the above plan, on November 22d, 1873, the cleft was half an inch long and a quarter of an inch wide. Two sutures were introduced, and were removed in seven days. She was discharged at the end of the third week, with firm union of the whole palate in the median line, and the lateral clefts closed.—*London Lancet.*

EDITORIAL, ETC.

The Recent Decision in the Vulcanite Suit.—BOSTON, May 8th, 1874.—*Dear Sir.*—It is my duty to notify you that the case of "Goodyear Dental Vulcanite Company vs. Dan'l H. Smith," (the case so ably contested by Henry Baldwin, Jr., Esq., and Hon. Jeremiah S. Black, the counsel employed by Sam'l S. White, of Philadelphia,) has been to day decided by the Hon. Geo. F. Shepley, Judge of the U. S. Circuit Court, in favor of the Company, upon all the points at issue. Copies of the Opinion, as delivered by the Court, may be had upon application to this office.

By request of many of the leading members of your profession, the Company has forborne to send its Agents out for collection

of delinquent License fees until the decision of this case should be announced, the same seeming to be regarded as a TEST CASE upon the rights of the Company.

Now, however, this case having been fully decided, we shall require prompt payment from all parties using Rubber who have not already secured their Licenses for the present year.

We give this especial notice, as the Agents of the Company have been now sent out upon their duty of collection, and CASH PAYMENT will be required of all. You can now receive License by remitting the amount, of which you were notified, to this office, when License will be sent you by return of mail, accompanied by a copy of the opinion of the Court, in pamphlet form. More than one third of the year has now elapsed, and no note therefore, will be taken for any portion of the License fee, but CASH will be required of all without exception, and one object of this timely notice is that all may be prepared with funds on arrival of the Company's Agents, unless License shall already have been procured from this office.

Trusting, yet once again that a quiet acquiescence in our rights may cause litigation to cease, and the often asked for reduction of License fees to be made by the Company, I remain

Yours Respectfully,

JOSIAH BACON, TREASURER.

This notice was issued by the Rubber Company so soon after the opinion of Judge Shepley, of the U. S. Circuit Court, was delivered, that it was probably the first intimation that the majority of the practitioners of Dentistry had that this case, which was regarded with so much solicitude, had been decided adversely to their interests.

Judge Shepley says: "Upon a careful review of all the evidence in the record, I have no hesitation in coming to the conclusion that the invention of Dr. Cummings was a new and useful manufacture, that nothing appears in evidence to show that he was not the original and first inventor of the thing claimed by him, that the re-issued patent in suit is a good and valid patent, and that the defendant has infringed the same, as alleged in the bill."

This decision of a U. S. Circuit Judge has surprised many who were in hopes of being speedily relieved of what they have

always regarded as an unjust tax, and to which the parties collecting it had no claim whatever. The older members of the profession, those engaged in the practice of Dentistry at the time rubber was first introduced as a base for artificial teeth, knowing that this material was so applied and used both in this country and Europe long before a patent was granted to Cummings, are not disposed to quietly acquiesce in a decision which they regard as being so unjust to themselves and others. and trust that justice may yet be meted out in that final tribunal, the Supreme Court of the U. S.

Should this last hope prove delusive, then nothing remains for those who wish to continue the use of rubber but submission, until such time as the Cummings patent shall expire, when every effort should be made to prevent its renewal.

The Annual Meetings of the Associations.—During the latter part of the present and the beginning of the next month, the annual meetings of the different Dental Associations will take place; and from present appearances, and the great interest manifested to secure a large attendance, there is good reason for believing that these meetings will prove very instructive and beneficial to all who are fortunate enough to be present and participate in their proceedings. Below we give the time and place of meeting of the different organizations:

Southern Dental Association.—The sixth annual meeting of the Southern Dental Association will be held Tuesday, the 28th of July, 1874, in the city of St. Louis, Mo.

ROBT. ARTHUR, M. D., D. D. S., President.

JAS. F. THOMPSON, M. D., D, D. S., Recording Secretary.

EXTRACT FROM THE CONSTITUTION.

Art. III—Membership—Membership in this Association shall consist of such only as shall have received a degree in Dentistry, or Medicine, and who is engaged in the practice of Dentistry, and receives a three-fourths vote of the members present to elect.

Art. XIV—Delegates.—This Association will receive one delegate from each Dental Association or Society, and also one delegate from any corporate Dental Association.

The Executive Committee have made full arrangements to insure a successful and pleasant gathering.

The printed circular of invitation informs the profession that the railroads will furnish tickets at a discount of from 10 to 25 per cent., according to number taken, but advises those who can to get excursion tickets to St. Louis. Twenty per cent. discount from regular rates may be had at the principal hotels. The sessions of the Association will be held in Polytechnic Hall, and Dr. Isaiah Forbes will deliver the address of welcome.

The Nineteenth Annual Meeting of the American Dental Association will be held at Detroit, Michigan, on the 4th of August next. The following are the principal officers of this Association: President, T. L. Buckingham, M. D., D. D. S. Recording Secretary, M. S. Dean, D. D. S. Executive Committee, Drs. G. L. Field, G. R. Thomas and G. H. Cushing.

The Annual Meeting of the American Dental Convention will as usual, be held at Saratoga Springs, N. Y., on the 11th of August next. The following are the principal officers of this organization: President, John Allen, D. D. S. Recording Secretary, C. S. Hurlbut, D. D. S. Executive Committee, Drs. Ambler, Weed, Gage, Kake and Meritt.

American Academy of Dental Science.—The Seventh Annual Meeting of the American Academy of Dental Science will be held in Boston, on Monday, September 28th, 1874, at 10 o'clock A. M.

The annual address will be delivered by Dr. W. W. Allport, of Chicago.

E. N. HARRIS, Corresponding Secretary.

The Annual Meeting of the American Dental Society of Europe will be held at Geneva, Switzerland, on the 2nd of the present month—July.

OBITUARY.

The Late Dr. Hamlin.—A meeting of the dentists of Nashville was called at the office of Dr. Ross, for the purpose of paying a last tribute of respect to the memory of Dr. T. B. Hamlin, who died at his home near Edgefield Junction.

Dr. Ross was appointed Chairman of the meeting, and Dr. Noel Secretary.

A committee of three, composed of Drs. Morgan, King and Cobb, were appointed to draft suitable resolutions.

After a short consultation the committee presented the following, which were adopted.

Whereas, God in His Providence has taken to Himself our highly esteemed friend and former colaborer, Theodore Burnam Hamlin, D. D. S., and believing the Almighty Father doeth all things well, and that his providence are always wise and good, we bow with humble submission to his Divine will.

Resolved, that we here record our high appreciation of his character, both as a Christian gentleman, and a professional man. And we would call to mind his marked energy of character, his concentration of purpose, and his lofty aspirations for perfection as worthy of imitation.

Resolved, that we cherish the memory of his life, and especially of his professional life, and hold it up as worthy of imitation by our professional brethren.

Resolved, that in his death, his family lose a kind and affectionate husband and father, his Church an upright, zealous member, and the Masonic Fraternity one of its brightest jewels. But our brother so lived that

> "When the summons came to join
> The innumerable caravan that moves
> To quarry the mysterious realms, where each shall take.
> His chamber in the silent halls of death,
> He went, not like the slave at night,
> Scourged to his dungeon, but, sustained and soothed
> By an unfaltering trust in God, he approached his grave
> Like one that draws the drapery of his couch
> About him, and lies down to pleasant dreams."

Resolved, that we will attend his funeral services in a body.

Resolved, that a copy of these proceedings be sent our daily papers for publication, and that a copy be furnished the family of the deceased.

Resolved, that a copy of these resolutions be furnished all the Dental Journals for publication.

Dr. Hamlin was born on June 24th, 1810, in Windom, New York. He was left an orphan at an early age without means, and almost without friends or kindred. At eighteen years of age he was foreman in the largest watchmaker's establishment in Albany, and perhaps in the United States, where his attention was first directed to dentistry. He removed to Wytheville Va., about 1834 or 1835. At this time we find him taking an active part in the organization of Dental societies. He assisted in the organization of the Virginia Dental Society, the first of its kind in America or in the world, so far as is known to the profession. He removed to Tuscumbia, Ala., about the year 1845, and thence to Nashville in 1847, where he did a large business in connection with Dr. Morgan, until the close of 1858, at which time his health failed, and he went into the nursery business in connection with bee culture. In the latter business he was authority, having published a practical and highly-prized work on bee culture a few years since. He was also Vice-President of the National Association of Apiarians at the time of his death.

Dr. Hamlin was a member of the Presbyterian Church and an ornament to the Masonic fraternity. He was a member of indomitable energy, and for him to conceive, was to execute.

MONTHLY SUMMARY.

Neuralgia Treated by Phosphorus.—Dr. Bradbury has in the out-patient department of Addenbrooke's Hospital, Cambridge, been lately testing the value of phosphorus in neuralgia. On the whole, he has met with considerable success from its administration. The following are two cases in which the drug effected a cure when other remedies had failed.

Case I.—E. P., aged 24, single shop-woman, living in Cambridge, was first seen on October 20th, 1873. She had suffered from trigeminal neuralgia of the left side for three months. As the bowels were confined, and she was somewhat anæmic and the catamenia scanty. a draught containing one grain each of sulphate of iron and sulphate of quinia, five minims of dilute

sulphuric acid, and half a drachm of sulphate of magnesia, in an ounce of peppermint water, was ordered thrice daily. She persevered with this mixture till December 22d, with only slight improvement. On this day the pain was very severe, and she was ordered a phosphorus capsule (= one-thirtieth of a grain of phosphorus,) to be taken twice daily after food. After taking two capsules, the pain entirely ceased; and on January 12th, 1874, the patient was discharged quite well, having had no recurrence of the neuralgia.

Case II.—E. H., aged 40, married, and living at Haslingfield, first came as out-patient on November 26th, 1873. For eight weeks she had had very severe trigeminal neuralgia, her features, being expressive of great suffering. She was suckling her baby, although the child was fifteen months old. She was directed to wean the baby, and to take a mixture containing two grains of quinia and fifteen minims of tincture of sesquichloride of iron in an ounce of water twice daily. On December 6th, there was no improvement. As cases of ague had been admitted from this locality, Dr. Bradbury thought it possible the neuralgia might be of a malarious character, and ordered a mixture containing five minims of solution of arseniate of soda, one drachm of tincture of hop, and half an ounce of water, to be taken thrice daily, with the meals. A chloroform and belladonna liniment was also prescribed to be applied to the painful part. When next seen (December 20th,) she was as bad as ever, so a phosphorus capsule was prescribed, to be taken thrice daily after food. The patient was also ordered to rub into the temple every night a little aconitine ointment. The relief from this treatment was most marked; and when the patient was last seen, on January 31st, 1874, there had been no recurrence of the pain for more than a month.—*Brit. Med. Journal.*

Chloral Poisoning Cured by Strychnia.—A man who had taken an overdose of the hydrate of chloral, for the purpose of self-destruction, was recently taken into a hospital in Berlin. The amount of the poison was 34 grammes, or about 870 grains. He lay in a heavy sleep, respiring deeply, with congested face, and a pulse of 100. As there were no symptoms that were regarded as immediately threatening, the treatment was confined to cold applications to the head. An hour and a half later the face became livid, the pupils were widely dilated, the pulse fell to 92, the temperature rose to 103.4, and respiration became intermittent. The pneumogastrics were then faradized, and the normal respiration returned. Half an hour later symptoms of collapse set in, the pupils became contracted, the face grew pale, and the heart almost ceased to beat. A hypodermic injection

of one twenty-fifth of a grain of strychnia was then given. The beating of the heart was materially strengthened, and the pupils were dilated. These favorable symptoms, however, lasted but a short time, and the face again became livid, the heart-beats were fainter, and the pupils did not re-act. At this time about one twenty-fifth of a grain of strychnia was administered hypodermically. The action of the heart was again restored, but the respiration was labored. It was necessary to resort to faradization, which was kept up at intervals during the night and part of the next day. On the same afternoon the patient had recovered his consciousness. Notwithstanding the large quantity of chloral taken, there were no gastric symptoms, which was explained on the ground that the patient had eaten largely of rye bread before taking the poison. This case is illustrated of the value of strychnia in poisoning by chloral. Liebreich was the first to show the physiological antagonism between the two substances. It is noteworthy that faradization played an important but secondary role in the case.—*Berl. Klin. Woch.*, 1, 1874.

Blue Pus.—It is well known that pus, and the dressing of neglected wounds, sometimes show a blue color. The *American Journal of the Medical Science* contains an article on this subject condensed from the *Medical Times and Gazette*, and one from the *Archives Gen. de Med.* This blue color of pus may become epidemic, as was the case in M. Gosselin's wards in the Charite at Paris. Cases are also on record in which the normal secretions, as sweat, milk, and urine, have been of this color. Two sources for the color are indicated: one, the hæmoglobin; the other, the indican of the urine. Hæmoglobin, effused, assumes the varying colors seen in a bruise; in an old clot it becomes hæmatoidin, identical with the red coloring matter of the bile. The action of nitric acid, which is a process of oxidation, produces a blue tint in the bile. Perhaps a similar oxidation of hæmoglobin gives rise to the blue of the secretion, or the pus,

Various theories have been advanced to explain the blue coloring of the dressing wounds. One, favored by Lucke, is that it is due to vibrios. [Our readers will bear in mind the theory that all decomposition is caused by fungi, or other microscopic organisms.] This theory of the vibrios would explain the epidemics, if we might so call them, which occur where there is a neglect of cleanliness, in a hot, moist weather.

A blue coloring matter, called pyocyanine, has been isolated from blue pus, which resembles indican, a blue coloring matter occurring as a normal constituent of urine and probably of the blood also. This indican may be the source of the blue color of the pus and secretion.

The Archives de Med. considers the blue color to be of three kinds: 1st. The coloration resulting from the modification of certain humors—or true blue coloration; 2d. Coloration due to fungi—false blue coloration; 3d. Coloration due to a substance still unknown—false blue suppuration. The name *cyanchorse* is proposed for the last. It commences and ceases suddenly, not only where there is a wound, but where the parts are sound. Its duration is variable It produces no modification in the local condition of the wound, or the general health of the patient. Its progress is similar to that of erysipelas. It is sometimes epidemic. It occurs most frequently when the atmosphere is moist and warm and contains ozone, and during storms. Its presence is a favorable prognostic.—*Med. Examiner.*—*Missouri Clinical Record.*

How to Check Coughs.—Dr. Brown Sequard, in his late Boston Lectures, says that there are many facts which show that morbid phenomena of respiration can always be stopped by the influence of arrest. Coughing, for instance, can be stopped by pressing on the nerve of the lip in the neighborhood of the nose. A pressure there may prevent a cough when it is beginning. Sneezing may be stopped by the same mechanism. Pressing in the neighborhood of the ear, right in front of the ear, may stop coughing. It is also preventive of hiccough, but much less so than of sneezing or coughing. Pressing very hard on the top of the mouth inside is also a means of stopping coughing. And he adds, that the will has immense power there. There was a French nurse who used to say, "The first patient who coughs here will be deprived of his food to day." It was exceedingly rare that a patient coughed then.—*Med. and Surg. Reporter.*

Determination of the Age of the Human Embryo by the Evolution of the Teeth.—M. E. Magitot has been occupied in the solution of this problem, so important from a physiological point of view. He has determined that a maxilla or even a fragment of a maxilla may now suffice to fix the age of the embryo. The author gives in a table his conclusions, which we regret to be unable to publish for want of space. In a communication about to be published, the author intends to use the evolution of the dental follicles in determination of the age of the newly-born child.—*La France Medicale*, May 6, '74.—*The Clinic.*

Oxygen Gas as a Remedy in Disease.—Prof. J. L. Cabell, M. D., Univ., Va., regards oxygen gas as a most valuable agent in all diseases involving defective respiration, and as a tonic to improve assimilation in chronic diseases.—*Va. Med. Monthly.*

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ARTICLE I.

Dentistry.

BY P. H. AUSTEN, M. A., M. D., D. D. S.

Address delivered before the American Academy of Dental Science, at their Sixth Annual Meeting, held in Boston, September 29th, 1873.

Mr. President and Fellows of the American Academy of Dental Science:—MEDICINE is as old as human disease, which it seeks to cure; and MECHANISM dates as far back as the wants of mankind, to which it ministers.

Youngest born of these two is DENTISTRY, bearing more distinctly than any known art the impress of its double lineage. For what branch of Medical Art so dependent upon mechanical genius; and what branch of Mechanism so directly addressed to the relief of those ills which human flesh is heir to?

The childhood of Dentistry has been unfortunate, in that, while disowned by one parent, it has been taught to look down upon the other. For Medicine, in all ages, has been prone to despise Hand-craft, as beneath the attention of

those who claim that, by pure might of intellect, they can conquer the many-headed hydra—Disease. But medical practice is no longer the unit it once was; and the "Family Physician" is soon destined to become an institution of the past.

As the centuries roll on, the boundaries of Science and Art are enlarged, but the measure of individual capacity remains the same. Hence, Medical Practice divides and sub-divides, in order to the fullest development of its several departments.

The physician has no longer time for Pharmacy or Surgery; nor dare he hereafter affect to despise Arts quite as essential to life as his own advice and prescription. Even this advice, to be most effective, grows out of the special study of separate organs.

Thus the Body Medical, like the human body which it studies, is composed of many members. "The eye can no longer say to the hand, I have no need of thee;" for so close is this union, that when one member suffers, all must suffer; and when one is honored, all should rejoice. Why, in this great family of the Medical Arts, is young Dentistry so neglected and excluded from the family circle? Partly because he don't like his books, and this family is proud of its intellect and high education; partly because he is too fond of his grandfather's workshop.

The first is a grave fault, to be hereafter noticed; but is the second a just ground of reproach? Shall we stigmatize Dentistry, born in this 19th century—the century of invention—for having so large an element of mechanism? Gentlemen of this Academy, guardians of Dentistry, (as yet a minor,) do you also share in this one-sided pride of lineage? If Mechanism, *per se*, is discreditable, so is Dentistry; for it is its very life blood. As well might a man be ashamed of his own mother.

I have elsewhere divided Dental Art into Medical, Surgical, and Prosthetic. The two first connect it with the healing art, and demand a medical education; but the char-

acteristic element of Dentistry is its Prosthetics,—just as Therapeutics is the specific function of the Physician. To remove diseased structure, and replace it with gold,—to remove diseased organs, and replace them with porcelain,—is the work which demands nine-tenths of the dentist's time; success in which gives him his reputation.

You can call the one Operative Dentistry, and the other Mechanical Dentistry, if you choose; but each consists in a series of operations, and both are purely mechanical manipipulations of material, by means of instruments; both, also, are acts of replacement. I think it, therefore, more exact and descriptive to subdivide the peculiar work of Dentistry into—Structural and Organic Prothesis.

Both are so difficult, that highest excellence in either department is rare, and scarcely ever do we meet with a "double first class." Hence, the practice of Dentistry is itself subdivided, following the example of its parent art. But subdivision does not imply less honor in the pursuit, so long as we recognize, in preparation for it, the necessity of a knowledge of the whole art of which it forms a part.

This brings us to the only valid objection against the recognition of Dentistry as a specialty of Medicine. If it be true that dentists, as a class, have a more defective education than other specialists; if it be true that a large number of recognized members of the Dental profession have no medical education whatever, there is good reason for this hesitancy.

Is Dentistry, then, a LIBERAL profession? Yes, certainly, if the majority of its members are men of liberal education. Medicine numbers among its practitioners very many half-educated and not a few wholly ignorant men. But such are not the men who to-day control that profession; or who, in the past, have given it dignity and reputation.

I have already intimated that Dentists are too prone to spend in mechanical details time which should be given to study, and to adopt the popular error that a "mechanical turn" is the one grand element of success. It is indeed a

sine qua non, without which the selection of the Dental branch of medicine would be a sad waste of effort. But skill without education, art without science, cannot be called a Profession—I mean in the modern sense in which that term is applied to Law, Medicine, and the Ministry.

How shall we separate from the mass of those who call themselves Dentists such as may justly claim to be members of the profession of Dentistry, and, by virtue of this claim, members also of the Medical profession? This is the most imperative, as it is the most difficult, duty which to-day lies before this Academy. Effort in this direction must be co-operative: it must also be harmonious.

Personally you are each responsible for your *individual* reputation; personally, however, you can do no more than add a unit to the *collective* reputation of the profession. But, by associate action, you can decide who shall unite with you in establishing a general professional character.

Dental societies, associations, and academies have heretofore suffered other and less important objects to engross the hours of conference. Undoubtedly much good has been done by such meetings. But to what purpose do you improve the field of your labors unless you first enclose it, and have a well guarded entrance? What harvest can be gathered on an open common?

Gentlemen, I call upon you, first of all, to establish your metes and bounds, and enclose your domain; for then, and only then, can you hope to reap the fruit of your toil. Then, with some hope of general adoption, can you frame a code of professional ethics, and encourage gentleman to enter the profession by guaranteeing them the courtesy due to gentlemen. Then can you establish a higher standard of work than cheapness, and bring about a more generous rivalry than underbidding and defamation. For you well know that there is a large class whose actions, unnecessary to be here specified, greatly damage the character of the profession which it is your pride to honor. You must exclude or reform them—and that by half-way measures—or you must fall to their level.

You must also establish a Dental Literature. I do not mean text-books, although these might be increased in number, and, in some departments of the art, greatly improved. I do not refer to the so-called Dental journals, which, for the most part, are chiefly advertising media of depots or colleges. Now and then we find in them an excellent article; but alas! what an iteration, *ad nauseam*, of experiences, which a little more reading, study, and general education might have spared both writer and readers!

I speak of thoughtful and well written monographs and treatises, which shall not only interest the dental, but command the notice and approval of the medical profession; articles, showing that there are able and experienced men in your profession willing to spend some hours for its advancement, not measured by the golden rule of the operating chair.

Making ample allowance for difference in the number of physicians and dentists, we are forced to the conclusion that Dentistry is the least literary of all the departments of Medicine. Let us charitably attribute this to the modesty of a young profession, and hope for better days.

A much neglected yet most important element of Dental Art is its Æsthetics. It is a fact, much to the discredit of the profession, that many forms of great beauty in ceramic art lie in dental depots unsought for, because of the incapacity of dentists to appreciate and use them. Thus artistic genius is repressed in its efforts to benefit Dentistry, and the Art itself suffers in reputation, because it seems to be incapable of what it can really accomplish. Take this in connection with one other fact—that second and third rate apparatus, implements, and materials find more ready sale than first class and higher priced ones—and we are brought to the melancholy conclusion that not only is there too little science among dentists, but that the much boasted "Art and skill" which is to take precedence of all other qualifications, is really not of the highest order.

I gravely doubt if the average mechanical skill exercised in dental offices and laboratories would be tolerated for a

day in any machine-shop in the land. When I said that in mechanism *per se* there was nothing degrading, I referred to no such work as this. For there is here an incompetence or a neglect which has nothing to excuse or redeem it, and which is, in the highest degree, disgraceful. It argues nothing against the Dental profession to condemn such workers, for they do not belong to it.

I have reserved for final consideration the duty of your Academy in the matter of Dental Education; for in this work the Academies and Societies of the profession must take the lead,—the Colleges play only a subordinate part, however important. Misapprehension on this point has led some of the best men of the profession to censure our colleges with undue severity.

They have done great good, and their teachers have generously given a vast amount of time, thought, and labor to the cause of education. I say *given;* for the compensation, as compared with that awarded to dental services, has ever been paltry, and has often been in the form of actual loss. Had those who blame been half so faithful to their office students, as college professors to theirs, the schools would have had better material to deal with. Had societies enforced compliance with the standard of the colleges, low as it is, we should to-day have had a far higher standard of professional education. As it is, the better half of the young men of the profession owe more to the colleges, than to any other single influence.

Although therefore not failures, in that they have done much good, yet must we write on the walls of our colleges the sad word "TEKEL." They have been "weighed in the balances, and found wanting," not only because unsustained, but because organized after the model of American *Medical* schools. Medicine gains no honor through the average medical graduate; and more credit is given to the average dental graduate, only because so many dentists lack even that amount of preparation.

The American physician supplements the defect of his education by walking the hospitals of England and Europe.

But American dentistry so far excels the transatlantic in her Prosthetics, that Europe comes here to learn. Where, then, can we go to make up our shortcomings in the other branches of Dental Education? I answer: by remodelling the entire system of dental instruction.

All Dental Colleges south of Boston are organized upon the plan of the Baltimore College of Dental Surgery, to whose principal founder, President CHAPIN A. HARRIS, the profession is so greatly indebted. You will, I trust, acquit me of disparagement or disrespect to my college, the *Alma Mater* of some members of this Academy, if I tell you what I think are the grave defects of this organization, as time and experience have revealed them.

First, then: it receives students without preliminary examination. No literary college does this; and no professional school can do it, without gross injustice to itself. It is hard enough to be compelled to crowd four years' teaching into eight months. But when the recipients of this teaching have no trained habits of study; know nothing of the first elements of science, and have not even such slight knowledge of Latin and Greek as enables them to understand the necessary technicalities of Medicine,—then is the work of instruction worse than Egyptian Bondage; it is, truly, "making bricks without straw."

Secondly: it examines for graduation after TWO terms of study. So much has been said upon this point, that I shall dismiss it with one remark. The profession that tolerates, for its raw recruits, less than four years of diligent study (mark me, I do not mean simply four courses of lectures,) must be content to allow its colleges to send ont many graduates imperfectly prepared to enter its ranks.

Thirdly: the Faculty are the Examiners for graduation. One of three evils is unavoidable. The professor must hold himself sternly aloof from his pupils, thus loosing one of the most effective aids to his teaching—the friendly word of advice and encouragement. Or he must do grievous violence to his feelings by rejecting those, whose struggling progress

he has watched and aided with such interest. Or he must risk the character of the profession and of his school by giving honor to those unworthy of it.

No teacher should be placed in this dilemma. The English examiner gets handsomely out of it, by retiring from the room, if the student chances to be even socially and ever so slightly known to him. I commend the English custom for American adoption, well satisfied that, until examiners and teachers are totally distinct bodies, no diploma can be quite clear from suspicion of partiality.

It is said that Faculties are afraid to be rigid in examination, for fear students will prefer a more lenient school. The sooner such a school ceases to have graduates the better. But gentlemen, in justice to students, permit me to give, as the result of my twenty years' experience, that all students, who deserve the name, respect and love most those teachers who put them through the severest drill.

To the Boston Faculty of Dentistry I tender this word of advice: Be as radical in your profession as you were in your politics. Refusing to compromise with slavery, you, with a high hand, abolished it. Do not, then, be yourselves slaves to the past, through timid fear of the consequences of radical innovation. As Alumni of the Baltimore School, give your Alma Mater all honor for what she has done, but do not copy her mistakes.

Thirty-three years is an average human life, but a very short period in the existence of a profession. Dental education may, without shame, confess the errors of its infancy, especially if this confession throws light upon the pathway of the future. The new experiment can come from no city with better grace, than from the modern Athens.

May I, gentlemen of the College and the Academy, wishing heartily success to your efforts, offer for your consideration a few parting words.

Under the shadow of old Harvard, do not make your connection with her Faculty a pretence and a sham by accepting students, who have not pursued an honorable course of literary study.

Working in harmony with the Medical School, do not dishonor your specialty by accepting from your graduates any lower grade of medical knowledge, than is required for the oculist, aurist, or general surgeon.

Build up for Dentistry what other departments of Medicine possess in their magnificent hospitals, asylums, and infirmaries. For medical education is rapidly resolving itself into clinical instruction in specialties. The time, I think, is not very distant when a rigorous examination in the science of general medicine will be demanded as essential to admission to the wards of all hospitals for specific diseases, and when years spent in the best of such institutions will be the only recognized qualification for the practice of any medical specialty.

If the College will thus acquit itself, and the Academy will labor in connection with other societies in the States for the establishment of a "Supreme Court," whose decisions as to professional character shall be final—Dentistry will enter upon its manhood under auspices which will attract her right proportion of the genius, talent, and energy of the country, and will reflect back upon her members the honor and dignity which she receives from them.

ARTICLE II.

Taking Upper Impressions of the Mouth.

BY GEO. S. FOUKE, WESTMINSTER, MD.

Compression of the alveolar and palatine surfaces by direct manipulation and diversified pressure, after the ordinary perpendicular pressure is made, being of great value and efficacy in performing the operation, the taking of an impression of the roof of the mouth is strictly analogous in a mechanical sense, to the process of ordinary "moulding."

The simple process of "*running the mould*," by which the skilled artisan accomplishes his task of getting a correct impression of the model, is the exact process we have

...ly correct impression
... solid metal cup used
... unsuited to this mode
... the cup spoken of in
... which is here illustrated

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... g metallic frame, de-
... d to support the flex-
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... to. The combina-
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... affords ready means
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... nst the canvas lining
..., first with the fingers,
... a "ramming" tool
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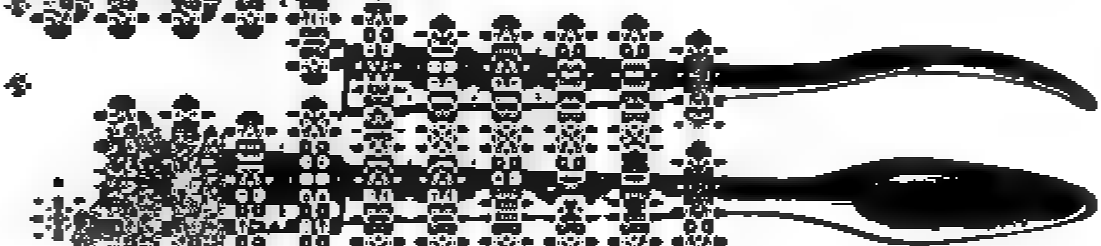

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terial employed, as it is the manner of working it, that insures the perfection of the work. The perfectly distributed pressure against the cushioned mass of gutta percha, wax, or whatever is used instead, is the essential feature in the process; and when this is skilfully and properly done, impressions of most remarkable correctness are the result.

In taking impressions with the cup we have described, we have recommended the removal of the cup from the mouth, and its re-insertion as often as may be found necessary; except when plaster is used, when of course this would be impossible. In using wax or gutta-percha, the withdrawing of the cup from the mouth is a great relief to the patient, and it will be found advantageous to the operator likewise. He can examine the work and see how the operation is progressing. He has perfect control of the material in the cup, and removing and replacing of the impression will not interfere at all with the final result, but rather help to reach it the more easily and certainly.

In taking a wax impression, the process is very simple, and needs no explanation; but in the use of *gutta percha* it may be well to give some directions. *Gutta percha* is our favorite material for taking impressions, and our method of procedure with it is as follows: Provide hot and cold water; the plastic *gutta percha* is dipped into cold water just before insertion into the mouth; examine if the start is right; if you have too much material pinch off the surplus at the heel of the cup; dip the cup into cold water and promptly reinsert it to its place again in the mouth; after pressing up the cup pretty well, begin pressure against the canvas bottom, and carefully mould the material against the entire surface of the roof; remove again from the mouth, and dip the impression into cold water, quickly return it to the mouth, and by pressure against the sides of the cup, and also by compressing the canvassed mass of *gutta percha*, using the ramming tool; be sure that the material is brought into perfect contact at all points with the whole of the roof of the mouth; carefully remove now and try the impression,

that is, try it in the mouth and satisfy yourself that it is correct. It is well to make the plaster cast at once, or just as soon as the impression is completed. Use no oil, as the plaster does not adhere to the gutta percha. As soon as the cast becomes hard the gutta percha is softened by holding the impression in hot water; the cup is pulled off, and the gutta percha removed from the cast.

Due care and accuracy of manipulation observed in taking the impression, the dentist will secure a cast of surpassing correctness. The fit of the dentures when completed will be very superior.

Through the kind and gentlemanly co-operation of Messrs. Snowden & Cowman, as experienced manufacturers of impression cups, we have been enabled to get up new moulds for the improved cups we have designed; and these gentlemen have been entrusted by us with the manufacture and sale of the cup.

The cup is a novelty. Its superiority over the old cups, which for a long series of years have been considered as all that was wanted for the purpose intended, remains to be tested by an intelligent profession. When the mode of operation it embodies is fully mastered, we feel persuaded that the combination of the movable and flexible lining with the cup, as devised, will take its place as a useful and permanent improvement in mechanical dentistry.

SELECTED ARTICLES.

ARTICLE III.

The Use and Comparative Merits of the Bichloride of Methylene as an Anæsthetic.

BY BENJ. F. DAWSON, M. D., NEW YOK.

(Read before the New York Medical Library and Journal Association, April 17th, 1874.

While in London during June, 1872, I had the pleasure of being invited by T. Spencer Wells to assist him in a case of ovariotomy, in which he wished to test the merits of my clamp for the pedicle.

Aside from the great skill of this distinguished surgeon, I was much attracted by the appearance and behavior of the patient under the anæsthetic, as well as by the manner in which the latter was administered. In appearance the patient seemed to be in a natural sleep; neither her color nor respiration indicating that she was in a state of unnatural unconsciousness.

At the conclusion of the operation I was still more surprised to see how rapidly she recovered consciousness, not more than two minutes elapsing from the painless introduction of the last stitch and complete consciousness, shown by her opening her eyes and addressing Mr. Wells. There was no complaint of either nausea or headache.

On inquiry, Mr. Wells informed me that the anæsthetic used was the bichloride of methylene, or chloromethyl, as it is commonly called, and that he had used it for some time in preference to all other anæsthetics, for the reasons I will hereafter mention.

On my return home I brought with me a supply of chloromethyl, and the apparatus by which it is generally administered, and for the past two years I have used it, for myself and others, in both brief and prolonged operations.

The composition of bichloride of methylene is CH. CL. It is a clear liquid, with an odor somewhat sweeter than chloroform, boils at 88° Fahrenheit—54° lower than that required by chloroform—contains one atom more of hydrogen and one less of chlorine than the latter.

It resembles ether in being inflammable in air, but is more volatile, of more agreeable odor, and less irritating to the air-passages.

Chloromethyl was introduced as a general anæsthetic, in 1867, by Dr. B. W. Richardson, of London, who administered it for the first time in October of that year, in a case of ovariotomy performed by Mr. Wells, having previously subjected himself to its effects.

Since 1867 it has been extensively used in many of the largest hospitals of Europe, as well as in the practice of many English surgeons, by many of whom, notably Mr. Wells, it is considered superior to all other anæsthetic agents, with the exception that it is very expensive, from the fact that it is difficult to make it well, and still more difficult to preserve, owing to its liability to deterioration by exposure to light and air.

Like chloroform and sulphuric ether, it may be administered on a handkerchief or towel, or with any of the inhalers in general use; but from the peculiarity of being impaired by light and air, and its great volatility, it is best administered by such means as will guard against its being thus affected. Several apparatuses have been devised to accomplish this end, but none have been so generally endorsed as that known as Dr. Junker's, and which is the one preferred by Mr. Wells. Administered by this apparatus, a patient may be kept in a state of perfect unconsciousness throughout a prolonged operation; scarcely any of the vapor escapes into the room; neither the surgeon nor the assistants are

affected by it; the light is excluded from the chloromethyl, and the quantity inspired by the patient is wholly within control of the one administering the anæsthetic.

The effects of bichloride of methylene are very similar to those of chloroform, but anæsthesia seems to be much more readily induced by it, and is decidedly more easily recovered from. In fact, its action seems to combine the best properties of chloroform and ether. According to Mr. P. Marshall, who reported the use of it in five cases before the Medical Society of London, in 1867, the time required to put the patient under its complete influence was from 3½ to 7 min., and the quantity used from 2 to 7 drachms.

In 126 cases in which it was given by Mr. Richard Rendal, the ages varying from 6 months to 70 years, anæsthesia was produced in 30 seconds in 18 cases; in 60 seconds in 70; in 2 minutes in 25; in 3 minutes in 5; in 5 min. in 3; in 9 min. in 2. Of these 123 cases 50 recovered in 1 min.; 23 recovered in 2 min.; 9 recovered in 3 min.; 28 recovered in 5 min.; 11 recovered in 10 minutes.

In my own experience, as shown by the records of cases, anæsthesia was invariably induced within 2 minutes, the longest being 8 minutes—one case which had previously resisted taking ether. Recovery was correspondingly quick.

Its effects being much more rapid, from its great volatility, than those of chloroform, anæsthesia is also induced much more quietly, there being, according to the testimony of those who have used it extensively, a marked absence of mental and muscular excitement or rigidity.

Its effects upon the pulse are, at the outset, to decidedly stimulate and strengthen it; but it soon returns to about its normal state, and never in my experience, as will be shown further on, has fallen much below its normal rapidity or strength. This statement is also supported by the testimony of Mr Richard Rendal, who attributes its safety to this stimulating action on the heart, and its rapid elimination, as shown by the rapidity with which patients recover from its effects.

Its effect upon the pulse in the five cases reported by Mr. Marshall, already referred to, were as follows: In three it ranged from 74 to 80; others offered a marked contrast, for in them it ranged from 114 to 120.

In 15 cases of my own, of which a record of the pulse was noted, the following was the lowest the pulse ranged: In three, 75; in five, 80; in three, 85; in two, 88; in one, 96; in one, 98.

Its effects upon the respiration are similar to chloroform. In no case have I seen other than full and quiet inspiration and expiration, and that these functions are properly performed is attested by the generally unaltered color of the skin and lips, which are also in some cases increased to a clear scarlet. This testimony is also supported by that of others especially Mr. Wells, who has used it more than 350 times, and who writes: "The patient very seldom becomes pale, sleeps quietly, and seldom has much bronchial irritation."

The nausea usually following recovery from ether and chloroform is of much less frequency and severity after chloromethyl. In regard to this point Spencer Wells also says: "It is quite true that it has the disadvantage of causing nausea and occasional sickness, but in my experience this is almost always the rule with chloroform, whereas with chloromethyl it is *certainly exceptional.*" Mr. Rendal also states that "no sickness or headache follow unless the inhalation has been continued, or a second anæsthetic given to keep up the effects." In his 123 cases, already referred to, vomiting occurred in 15 only: 1 in 8—but in all of these latter it had been continued some time, and some had just been eating. In my own experience, in 31 cases in which I have administered it, nausea or vomiting ensued in but 6, in which latter it was administered for from 20 minutes to one hour, and for severe operations. I have never seen either nausea or headache ensue when it was administered for less than 10 minutes. And Dr. Thomas Bird, of Guy's Hospital, London, writing to me a few weeks ago, says: "As

to nauseating effects, if the administration is PROLONGED, the effects are the same as with chloroform, except that the *sickness is not so prolonged.*"

As to the question whether chloromethyl is less dangerous than chloroform, or as safe as sulphuric ether, there is some uncertainty.

Mr. Rendal, in his article already referred to, says: "As regards safety, I may add that I have not had a fatal case." And Mr. Wells likewise writes that in over 350 cases in which chloromethyl had been administered for him by Drs. Richardson, Junker and Day, "in very few of these operations was the sensibility to pain maintained for less than 5 minutes—in a few it was kept up from 45 minutes to an hour or more—yet I have never been at all uneasy during the administration or from any subsequent effects fairly referable to it, whereas with chloroform I never felt quite at ease; and although I have never lost a patient during operation, I have three times had to resort to artificial respiration, and I have very often seen patients suffer so much from *chloroform vomiting*, that the result has been imperilled, and in some cases a fatal result has been in a great measure due to this vomiting. When I add that between April, 1870, and March, 1871, I had 31 successive cases of ovariotomy in private practice, without one death, and that the last 24 cases of the fifth hundred, including both hospital and private cases, all did well—every patient having recovered—it must be admitted (as anæsthesia was complete in every case, not one patient having been conscious at any stage of the operation) that the anæsthetic is a good one."

In the 31 cases in which I have administered it, 5 being cases of ovariotomy, and 10 prolonged and severe uterine operations, I have never seen a symptom that made me feel uneasy, and none that so often seem alarming in using chloroform. Indeed, so safe do I consider chloromethyl, when it is carefully given, that I have not hesitated to let others administer in my operations, whom I considered com-

petent to judge of its effects, and Dr. P. B. Porter, who has given it for me eight times, as well as Drs. John C. Jay and F. H. Rankin, have had opportunity to watch its reliable action and evident greater safety over chloroform.

Death, however, has occurred during its administration, and, on looking through the literature of the subject, I have been able to find six cases recorded. In three of these the post-mortems show a large flabby heart; but though it may be proven to be more immediately dangerous than ether, yet the question can plausibly be asked, that if ether has not killed by its immediate anæsthetic effects, how many fatal results *after* operations have been due to its after effects?

Statistics kindly sent me by my friend Dr. Bird, of Guy's Hospital, give the following as the comparative death-rate of the anæsthetics now used:

Ether, 1 death in - - - - -	23 000
" and chloroform combined, 1 death in	5,000
Bichloride of methylene, 1 death in - -	5,000
Chloroform, - 0 - -	3,000

Having briefly stated the effects and apparent advantages of the chloromethyl, I will briefly report a few of the most prolonged cases of the 31 of anæsthesia induced with it by myself, and thus show all the advantages claimed for it.

Case I.—Oct. 24th, 1871, I was asked to administer it by Dr. Emil Noeggerath, at the German Hospital, in a case of ovariotomy. Pulse rose at first to 100, but soon fell to 80, at which it continued strong during the *hour and a half* occupied by the operation. Respiration and color natural; but *one ounce* of methylene used. Anæsthesia was induced in 3 minutes, and recovered from in 12, the duration of the latter being due to her exhaustion from the great amount of blood lost.

Case II.—October 30th, 1871, was again requested by Dr. Noeggerath to give chloromethyl in a case of ovariotomy at the German Hospital. Anæsthesia complete in 2 minutes. Pulse, 105 at first, fell to 84, and continued at that

rate, with but slight variations, quite strong. Respiration and color natural; recovery in 3 minutes; no nausea until evening, when vomiting occurred, as had been the case for 2 or 3 days before the operation, as is recorded in Dr. Noeggerath's report of the case to the Obstetrical Society. Operation lasted three quarters of an hour. ℨ v. methylene used.

CASE III.—Oct. 31st, 1871, gave methylene for Dr. Noeggerath, at German Hospital, in case of *ovariocentesis vaginalis.* Anæsthesia induced in 3 minutes. Pulse at outset rose to 95, but soon fell to 80, and continued strong at that rate during the operation, which lasted 20 minutes. Respiration and color normal. Recovered in less than 2½ minutes. No nausea and headache. ℨ iiiss. methylene used.

(These three cases will be found in the Transactions of the New York Obstetrical Society, reported in the *American Journal of Obstetrics* for Nov., 1872, and were witnessed by a number of our distinguished physicians.)

CASE IV.—Nov. 12th, 1872, was requested by Dr. T. A. Emmett to give methylene to a patient in the State Woman's Hospital, on whom he was to operate for vesico-vaginal fistula, and who had been exceedingly troublesome in previous attempts at anæsthesia. Was fully anæsthetized in 4½ minutes; made no resistance whatever. Pulse, 105 at first, soon fell to 80, at which it remained strong during the half hour occupied by the operation. Became conscious in less than 2 minutes; no nausea. When asked by Dr. Emmet how she felt, said "finely." But ℨ iij. of methylene used. Color and respiration natural.

CASE V.—Nov. 17th, 1872, was requested by Dr. Sims to give methylene to a lady on whom he was to operate for *carcinoma uteri.* Pulse rose at first to 112, but soon fell to 99 and 96, at which it remained during the hour and a quarter occupied by the operation. Was greatly excited at first, but soon breathed freely, and in 6 minutes was fully anæsthetized. Respiration and color natural. Lost con-

siderable blood; recovered fully in 4 minutes. Some nausea, but nothing vomited. ʒ j. methylene used.

Case VI.—Nov. 20th, 1872, was again invited by Dr. Sims to give methylene to a case he has to operate on for *vaginismus*. Patient greatly excited and nervous, breathed badly at first. Pulse, 105 at outset, fell in a few minutes to 80, anæsthesia complete in 5½ minutes. Operation lasted 45 minutes; recovered consciousness in 3 minutes; some nausea and slight vomiting. ʒ vij. methylene used.

Case VII.—Nov. 23d, was invited by Dr. Sims to give methylene in a case of amputation of the *cervix uteri*. Pulse at outset 95, fell to 75, and continued at that rate; anæsthetized in 3 minutes. Color unusually bright and respiration free and full. Operation lasted 50 minutes; recovered consciousness in 2 minutes; very slight retching. ʒ iv. methylene used.

Case VIII.—Nov. 3d, 1873, gave chloromethyl to a patient on whom I was to operate for fissure of *cervex vteri*. Took it well, and in 4 minutes was perfectly anæsthetized. Pulse at first 100, fell to 85, at which it remained strong during the 45 minutes of operation. Respiration and color good. Came out of effects in 3 minutes; no nausea. ʒ vij. used.

Besides the above typical cases, which I have selected as those in which the chloromethyl was given for the longest time, I have also the records of others equally convincing as to the advantages of this anæsthetic. I have given it also for Dr. T. G. Thomas in ovariotomy, for Kammerer, Janvrin, and Hanks in other cases, and I am sure they will agree as to its apparent advantages.

The conclusions to be deduced from the foregoing remarks as to this anæsthetic are the following:

It is pleasanter than ether and chloroform in odor.

It is much more rapid in its effects than any other anæsthetic.

It induces no muscular excitement.

Recovery is more rapid and complete than from ether or chloroform.

Nausea and vomiting are rarely induced by it.

Its effect upon the circulation is not so depressing as chloroform, and respiration is much more regular and free.

Like chloroform, its effects are obtained with a small amount, hence it is much more portable.

In fact, I can offer no better praise of its advantages than that by Spencer Wells, who says: "Indeed, the patient has all the edvantages of complete anæsthesia, with fewer drawbacks than I have ever obtained by the use of any other anæsthetics."—*Medical Record.*

ARTICLE IV.

Principal Cause of Constitutional Derangement in First Dentition.

BY J. HARDMAN.

Read before the Iowa State Dental Society, May, 1874.

This subject has received the attention and investigation of eminent medical men for centuries, and many are the views from the pens of learning in regard to the laws governing and the circumstances attending this process, at this critical period of the child's life.

The enigma—the mystery surrounding this subject of difficult first dentition, has been a source of great aggravation to the enquiring mind, exhibited in the great extremities of its effects. At one time the beautiful and expectant pearl has come so normally and so gracefully that the tranquility and health of the little pet has not in the least been disturbed. When, again, its advance and eruption is announced by symptoms of suffering and disaster that not only excite anxiety among parents and friends, but alas too often ends the tender life of the little sufferer.

Many are the affections that difficult dentition does often induce. Congestions, inflammations, with their attending consequences, attacking any of the vital organisms, producing cholera infantum, dysentery, meningitis, convulsions,

etc., in all their direst severity. Able authors have, in our text-books, advanced theories to account for this wonderful phenomenon; have given what they regard as the cause of such extensive and severe effects, arising apparently from so insignificant a change of structure. And we read and re-read, weigh and consider, and we find ourselves not satisfied with the arguments advanced and many of the conclusions arrived at.

We ask ourself if the physico-vital forces engaged in building up the tooth, cell by cell, and at the same time cell by cell is dissolved and carried away from the surrounding alveolus to fully prepare and maintain ample space without creating the least visible derangement, not only in the immediate parts, but also in the general system. What is it that can so disturb the vital harmony at the time the tooth is just about erupting, and in many cases partially through?

To supply somewhat of a plausible reply to this perplexing question this feeble paper has its humble aim, establishing if possible, a more rational and effective mode of treatment. Permit us then, while we ask your respectful attention, to first glance briefly at the usually accepted theory. Secondly, present what we regard the true theory. And thirdly, the rational local treatment as indicated from this stand point.

We will glance at the anatomical structure, and the physiology of the trigemini, and its co-workers the sympatheticus major.

The fifth pair of nerves rise low in the base of the brain, and with faciculi or filaments of origin descending down *via*, the pons varoli and medulla oblongata, making it a spinal as well as an incephalic nerve,—bearing in mind that it mostly supplies with its branches all the important parts of the mouth. The great sympathetic nerve in connection with the trigemini, furnishes extensive influence by its numerous ganglia plexus, anastomosis, etc. This latter nerve is as it were the connecting bond of the entire system of nerves, exerting and transmitting wonderful effect, both of

voluntary and involuntary force. This nerve, as it descends, sends off, externally and internally, branches to every portion of the body, contributing evidently not only to the sensibility and motion but also to special function in most of the vital organs. These then, the trigemini and the great sympathetic, are not only anatomically connected, but exhibit great influence over the general system. It is, therefore, when we contemplate this universal and intimate connection of the nervous system that we, to some degree can comprehend some of the mysterious phenomena where a local irritant in one part or organ may establish the most marked effects in another part or organ. Thus it has been observed where the pain in the knee was the result of disease in the hip joint. Where, in the adult, the dental surgeon so frequently meets, in the so-called neuralgia, the seat of pain and distress quite remote from the seat of disease. So in the infant; irritation in the alveoli through the media of impression made upon and through these great nerves, the stomach, bowels, liver, kidneys, lungs, brain, etc., are often the parts upon which the disastrous force is centred, thus causing impaired digestion, diarrhœa, spasms, coughs, convulsions, cephlic congestions and death.

That these dire effects occur from first dentition has long been observed; that the subject is intimately connected with the calling and duties of the dental practitioner is quite obvious. It is then a question of vital importance to the dentist to know the true cause of constitutional derangement in first dentition.

Dr. Delabarre thought it arises from a defection in the contraction of the investing dentinal capsule: while the lamented Dr. Harris more philosophically thought it may depend upon the pulp being pressed upon, this being caused by the unyielding gums after the osseous opening of the socket has relieved the point of the tooth. The former of these is a vain theory that has no commendable quality; the latter more plausible, but certainly defective in ascribing the pressure upon the nerve as arising from the resistance offered

by overlying gums or soft parts. Drs. Meig, Wood, Bond, Condie, Dunglison and a host of others impute also to the resistance offered by the gums as the seat and origin of the mischief. We wish, notwithstanding this great weight of talent before us, to be understood as placing no estimate upon the theory that the resistance from the gums contribute in any comparative degree towards causing the constitutional trouble. But we do believe, most confidently, the cause to arise from pressure upon the large and very vital pulp. The question at issue, as mostly claiming our attention, is from whence comes this irritating pressure? And why the mischievous effects from it.

We maintain that the resistance offered from the gums is of but small moment. That the true cause arises from pressure upon the nerve or pulp is certain. And that this pressure comes from an indirect way, namely: by the growth of the lower or root part of the tooth being too fast, so to speak, when compared to the removal of the osseous covering over its crown, thus holding it back, and it thereby pressing unduly and irritating the pulp.

We will here, then, in order the more fully to present our views, note what may be regarded as two axioms, viz:

1. Normal pressure promotes absorption of osseous tissue.

2. Too much, or undue pressure will, by inducing irritation, arrest absorption. It has long since been admitted, and backed by respectable proof, that a given amount of pressure being exerted will, by healthy, physiological action, stimulate the removal of osseous structure. And of this principle the dentist takes advantage in the treatment of irregular teeth, even in the mature jaw. But where a pressure becomes excessive, instead of a stimulation to activity, the normal function of the membrane compressed is by impediment of circulation, etc., irritated and inflamed, in many cases totally arresting action, save that proper to pathological law—namely, disease.

When we consider that the growth of the deciduous teeth is mainly by deposit of cell by cell, and the filling in of lime

salts particle by particle, from the crown towards the apex; and further, that the pulp or the nerve at this period forms a large portion of the contents of the dentinal capsule, and is of a highly vital organization; and still further, that the normal growth of this portion of the tooth does produce an upward pressure upon and against the capsular covering of the tooth, or lining of the bone; and that through this means in some way the osseous structure is dissolved and carried away. This process is usually normal before the first opening occurs in the bony casement, as there is seldom evidence of trouble up to this time.

It should be born in mind that the greatest tendency to constitutional disturbance arises from the eruption of the cuspid teeth. These being the most pointed in form we might readily be induced to think they should be most favorable to spontaneous eruption. It is, however, reasonable to conclude from observing the effects, and weighing the real principles of action, that the conical form is no advantage, but instead thereof, the reverse. The point may be brought through the osseous casement, and, in some instances, also through the soft covering of the alveolus, yet the acme of trouble not reached.

We shall endeavor here to show the bearing that the process of eruption in this peculiar form of teeth has upon this subject. We maintained that this phenomenon is owing to undue pressure upon the pulp, and not upon the tissues in advance of the cutting crown surface. This, then, is our theory, taking a cuspid as a case for illustration. The point is readily felt by the lancet in the hand of the surgeon; but his crucial incisions in the soft tissues have but little effect upon the attending constitutional symptoms, and why? To answer let us seek whence this undue pressure.

The point of the tooth having penetrated the bony surface, a large amount of resistance proper from below is taken off, hence allowing a greatly increased force being exerted upon the borders of the socket opening, and this force of pressure being too great is an irritant upon the por-

tion of the capsule surrounding this opening, creating inflammation in it and thus arresting absorption. Holding the tooth, in other words, immovably fixed. While thus stationary the growth of the tooth below still going on, must, it is obvious in its effect, produce indirectly pressure upon the pulp. And this is the whole mystery, undue pressure augmented by a portion of resisting surface already removed from over the tooth, and by irritation and inflammation arresting absorption, fixing the tooth in the socket, while the steadily increasing and elongated tooth, indirectly but surely, producing the pernicious pressure upon the pulp; and this in turn becoming by this pressure irritated and inflamed, producing in remote organs, through the intimate nervous union before referred to, the extensive sympathetic disturbance so often met.

It would seem from this illustration that we regard this abnormal change as much more liable in the cuspid teeth, as taking place at this critical time, and that the other teeth are to some extent exempt. This, we do think, is very much the fact; and account for it in this way. These conical teeth have their largest diameter near the middle or base of the crowns; thus, at the time of penetration of the alveolus by the point,.and the consequent removal of an equivalent amount of resistance, a much larger surface of the capsule is left to receive the augmented and irritating pressure. Whereas, in the more perpendicular crowns, with larger surfaces, being at once uncovered, leaves but little surface of membrane exposed to this over pressure, and consequent irritation. And we appeal to the experienced practitioner, if it is not usually the capsule in which the main constitutional disturbance is found.

From the drift of the description, it will be noticed that we dwelt upon the finding and fixing of the true local cause and its pathology; but leaving the mysterious philosophy of sympathetic action and phenomena mainly unnoticed. It will, however, be born in mind, that we aimed to point out the cause and not the effect of this constitutional derange-

ment. We do, however, regard it as befitting and right to close with a word as to the mode of local treatment in first and difficult dentition.

It follows from this view that we have taken, that the condition of the soft parts over the tooth is of small moment, save in diagnosis. But that the point to refer our attack in treatment is to relieve the tooth from its strangulation in the bony casement, and thus materially, effectually relieve the pulp from the undue pressure. To do this we would suggest that with a spear shaped chisel, or stiff lancet blade, the portion of the alveolus overlying and surrounding the impinged portion of the tooth be heroically broken up. Anything short of this will not meet the demands of the case. The only plausible good the mere incising of the soft parts may have, must be in the reduction of engorgement of the gums through the loss of blood, which must, of course, amount to very little.

As testimony of this radical practice, we can say that we have seen in cases coming under our immediate observations and care, the very best results. But we would insist here, that to be effective, the surgeon should not hesitate to remove or break up the bony casement freely down to or nearly to the largest diameter of the crown.—*Dental Register.*

ARTICLE V.

On the Mode of Action of Iodine and its Preparations.

BY PROFESSOR SEE.

Iodine may be made to enter the system through different channels—viz., the digestive tube, the skin, the mucous membrane of the respiratory organs, and the serous cavities.

The digestive tube is the most certain and natural channel, and it is this which is nearly always taken advantage of. The tincture of iodine is scarcely ever prescribed internally—in fact, it possesses no advantages, but offers, on the contrary, certain inconveniences. If it remain in the stomach

in the form of tincture, it produces a caustic effect on the mucous membrane of the digestive organ, but it always combines with a little soda or potash which it meets with in the stomach, and is converted into an iodated alkali. Hence it may be seen that those who administer iodine in its simple form are laboring under an erroneous impression if they imagine that the drug undergoes no change in the stomach.

The iodide of potassium should not be administered in the form of pills, as it is thus liable to produce a caustic effect on the mucous lining of the stomach; it should always be given in solution. And in prescribing this salt one should always bear in mind that the greater the quantity of liquid in which it is dissolved, the better the absorption. There is, however, a certain limit to the quantity of fluid to be employed, which of course a physician will not exceed, and which it is scarcely necessary even to mention.

The skin has often been selected as the channel for iodine to enter the economy. In employing an ointment composed of iodine in the proportion of one part to ten parts, in certain cases an effect is produced, in others nothing is obtained,—that is to say, in certain cases iodine has entered the organism, in others it has remained on the skin. It is expedient to know under what circumstances the iodine has been absorbed. Divers explanations have been given to account for the above facts. According to Professor See, two conditions contribute to the absorption of iodine:—1. To make iodine enter by the skin, the epidermis, which acts as a barrier, must be destroyed. To effect this, strong and repeated frictions of iodine ointment will have to be employed; but it is evident these cannot be continued, and a single friction would be perfectly useless. 2. In examining these facts, it is found that there are cases in which the epidermis has not been in the least affected by the frictions, and in which, nevertheless, the absorption of iodine might be proved. This would appear to be in contradiction to what has just been stated above, but it might be explained by the extreme volatility of this metalloid. When iodine is rubbed into the

skin in the form of ointment, it is found in the mucous membrane of the lungs; whereas when an ointment is made of an iodide, the latter is not found in the lungs, because it is not volatile, and does not contain free iodine Thus it may be seen it is by the air-passages, and not the skin, that the iodine entered the system; and in proof that this is the case, it is sufficient to leave a phial of iodine uncorked near oneself, and the latter will be absorbed without touching or putting it to the nose, for it is found in the secretions.

Quacks seem to have been aware of this phenomenon when they invented the sachets of the powder of iodine, iodized cotton, and iodized flannel vests which are to be worn next the skin. These diverse agents possess a real therapeutic property; but the explanation of their action is the same as that given above— that is, the iodine they contain is absorbed by the air-passages, and not by the skin. If a piece of iodized cotton be placed on the arm, and covered with a watch glass or a glass bell, nothing will be observed; but in a person who wears an iodized vest constantly, the iodine enters his economy, not by his skin, but by his nostrils.

Painting with the tincture of iodine has much the same action; we know to what extent this is now employed, and there is scarcely a pain, a case of scrofula or phthisis, in which it is not resorted to. In phthisical patients, the tincture of iodine externally has taken the place of blisters and cauteries; and the change is certainly to the advantage of the iodine; but its action is not that of blisters or cauteries. Here, also, the same explanation may be given of its action; but there is one effect which is scarcely suspected, and that is when the tincture is sufficiently strong, or the painting too frequently renewed, the epidermis is destroyed. The iodine enters the fissures thus formed, and produces inflammation of the cellular tissue, as has been observed at post-mortem examinations. To produce a more direct action on the tubercles of phthisical patients, it would certainly be preferable to place an open phial of the tincture of

iodine on a table near the patient, as has been practiced by M. Piorry, in order that the iodine may be inhaled.

Iodine baths are also intended to act on the skin. These baths, which used to be much lauded, are now seldom or never employed, as their efficacy is very much questioned. It has been asserted that after an iodine bath this metalloid has been found in the urine. In this case, how did the iodine enter the body? Not by the skin, but by the air-passages; and even then such a result cannot be obtained unless the bath-room be hermetically closed, and the patient remain in the bath some time.

Fomentations are also intended as a means of effecting the absorption of certain medicaments into the tissues. These substances are varied, according to the effect desired —such as the tincture of iodine, laudanum, belladonna, &c. As with frictions, a real effect is sometimes obtained with fomentations, at other times none. This depends on the state of the skin, which is different in different individuals. If the skin be soft and pervious, iodine and the other substances may be absorbed, but it is difficult to know when the skin is in a favorable condition for absorption and when it is not. There exists normally on the skin an oily coating, which opposes the penetration of the iodide of potassium. A soap bath may remove this varnish, but it is immediately reproduced; and individuals who have greasy skins, whatever they may do, will never succeed in making their skin absorb the iodide.

The same may be said of baths composed of the monosulphuret of sodium. Little or nothing is absorbed unless the doors and windows are closed, for the sulphuretted hydrogen which is evolved is about the only active agent, as it is taken up by the respiratory apparatus. This would explain the superiority of the sulphurous waters—such as Luchon, Barges, which whiten on being drawn—over those that do not whiten, as Amelie-les-Bains. Iodized baths owe their efficacy to the iodine being absorbed by the respiratory organs.

There are some natural iodated waters, but they are rare in France; there are only those of Salins and Salies, in Bearn, and it must be admitted that they are not very rich in iodine. In Switzerland they have the waters of Saxony; in Prussia, those of Kreutznach. These latter cannot be replaced; they are those that contain the most iodide and bromide of potassium combined. Nevertheless, the French might still avoid going to Prussia by utilizing hot sea-water baths. The sea water, and particularly the sea air contain a certain proportion of iodine and bromine. But it must not be forgotten that this atmosphere does not extend very far, and that about 400 or 500 yards from the shore we get the breeze, but not the iodized air; to have the benefit of this, one must remain the whole day on the beach, or, what is still better, take up his residence on the sea coast.

When iodine enters the economy it is easily detected, and is almost immediately found in the urine and in the saliva; but the whole is not found at once. The elimination of iodine takes place more rapidly when it is administered in the form of iodide; but in whatever manner it is given, when the iodine enters the blood it combines with the potassium contained in the corpuscles; and as the salts of potash are very diffusable, it is not surprising to find iodine in the urine almost immediately it enters the blood. Iodine remains in the economy longer than one would be led to suppose, judging from its facile elimination, and it is found in the saliva after its presence has ceased to be detected in the urine. The elimination of iodine is intermittent, and it has been frequently seen that an individual who had been eliminating iodine that he had been taking, ceases to eliminate for some time and then begins again to eliminate.

The same is the case with arsenic and mercury, particularly the latter. If you mercurialize a dog by friction, the animal may eliminate mercury during two months, two months and a half, even three months with complete intermission. This tardy elimination may be explained by the fact that the drug does not remain in the blood, but in the organs.—*The London Chemist and Druggist.*

ARTICLE VI.

The Most Efficacious Form of Arsenic for Devitalizing Dental Pulps.

BY THOMAS BURGH, D. D. S.

All who have used arsenic for this purpose, and who seek to thoroughly extirpate the pulp, have probably found some difficulty in uniformly procuring the utmost effect of which the material is capable. Either the common arsenic, if kept dry, and mixed at the time of using, is too coarse to be dissolved by the creosote or other fluid which is used as a vehicle, or it is too crude; or, if it operate well at first, it speedily deteriorates, and soon becomes worthless. There is a good article of arsenic ready prepared with creosote, sold at the dental depots, which works well at first, but which soon looses its quality, and a careful operator will throw the bottle away before a quarter of it is used. It is anything but satisfactory, after making an application of an arsenical preparation, to find that it is unreliable, or that it is deteriorating; that it works effectively in this or that case, but that it can never be depended upon; to find the pulp almost as much alive as it was before the application; that you cannot even open into it, or, if you can, you cannot extirpate any distance. If any man should tell me that he never had any such trouble, I should suspect that he was not in the habit of thoroughly extirpating the pulp, that he devitalized just enough to stop toothache, or to obtund the sensibility to the extent which would enable him to fill the tooth without any immediate periosteal irritation. And by thorough extirpation I do not mean the impracticably exact, unnecessary, and even undesirable following of every narrow and tortuous canal; but I should suspect that he does not even extirpate to the extent which is readily practicable with fine extirpators and broaches, and which is absolutely indispensable for the assurance of success.

It is not sufficient that we have an arsenical preparation which operates satisfactorily at first, or for a while, but

which will not retain its properties for any length of time. To say nothing of the expense, or even of the inconvenience of frequent renewals, deterioration must have a period of inception and of gradual increase; and it is unsatisfactory not to know when it has begun, and never to be able to tell when we can command the full power of the material. What we want, is a preparation which will not deteriorate, which will stand on the case a decade, if need be, and out of which the last particle will be as good as the first. Then we shall have something which can be depended upon, and we shall be subjected to no other uncertainties in its use, except those which spring from the constitutional idiosyncrasies of the patient.

I have tried all the different methods of using and combining arsenic, when I thought I would again resort to the dry article, and mix as I used it. In purchasing arsenic from the druggists I have always taken what they gave me, not understanding that there was any difference in the quality. This time, the druggist to whom I applied asked if I wanted the best. Surprised, I answered of course I did; when he gave me some of Squibb's. This preparation is finely ground, white, and almost an impalpable powder. It is a confession of ignorance, or inattentiveness perhaps, but I was unaware of the existence of such an article; and it may contribute to the satisfaction of my fellow practitioners to make them acquainted with it. It is the most efficacious and reliable material I have ever used. I keep it dry, and catch a little of it, about half or quarter the size of a medium sized pin's-head, upon a bit of cotton saturated with creosote, on the point of an excavator, at the time of using. I have had the article on hand now for a year, and I find it works just as well as when I first used it. I do not mean to say that it will destroy the pulp from crown to apex at one application. I should be suspicious of any preparation that was endowed with the strength, or was used in quantity to do so. But it will devitalize the pulp to an extent and with a uniformity which I have never before been able to

secure. I can invariably, after allowing the minute portion which I have described to remain not over twenty-four hours, open up the pulp, and remove a large portion of it, and sometimes I am enabled to remove the whole and fill at that sitting; while with other preparations which had been on hand as long as this, I could do little or nothing. With these the nerve might be sufficiently destroyed that it would not ache; but for all purposes of operating it would be as alive as ever. If I used larger quantities I might succeed in destroying the nerve thoroughly at one application, but I should fear that, from a quantity sufficient to destroy the nerve in so short a time, a surplus would be absorbed by the highly vascular cementum, and attack the periosteum in course of time. I prefer the safer method, even though it take longer. I seldom or never make a second application, applying creosote and tanic acid to prevent the decomposition of any portion of the pulp, which, upon filling, I may be unable to remove, and allow the remains of the pulp to slough, which takes about a week. If it is a tooth which shows, I employ but little tanin, as I fear it may add to the discoloration which usually ensues after devitalization, but if it is a back tooth, I use freely, as I find more satisfactory results attending its use than without it. Some operators allow the nerve to slough without attempting to open into it, after removing the application of arsenic; but I am urged to remove all I can, both of dead pulp, decomposed dentine, and of solid bone, by the consideration that the application of arsenic has been absorbed by these parts, and if allowed to remain there a week or so, might do serious injury to the tooth or alveolus. After it has done its first work on the pulp, I want to get rid of it and scrupulously clean and syringe out all that the arsenic has come in contact with, and that I wish to get rid of, until I strike a sensitive part of the nerve. Arsenic is a valuable dental agent in its place, but in bungling or reckless hands great mischief may be done with it; and if the quantity which I have sometimes seen used were allowed to remain in the tooth a week,

or even the remains of it after the first application, had been removed, without thorough cleansing, enough could be absorbed to destroy the vitality of a whole jaw. The human economy will stand a great deal of abuse, but that it is not safe to impose upon its powers, the terrible accidents which have been known to attend the inconsiderate use of arsenic attest. It is often the case that in making an application to an irritated nerve, the nerve is so exceedingly sensitive that it is impracticable to remove a mass of decayed dentine which may cover it. When the wax is removed, and the cotton on which the arsenic was applied, no arsenic is visible, although the wax, or other retaining substance, may have been so tight as to preclude the possibility of its all escaping around it. The arsenic may be found, some of it in the dentinal structure, some of it in the pulp, some of it may have escaped around the wax, but most of it is in this spongy mass of decay, awaiting only the presence of moisture and the lapse of time, to penetrate the tooth, or to insensibly assail the periosteum around the margins of the gum, if the cavity is near it. Before the tooth is allowed to stand for the nerve to slough, this mass of decay should be swept away, if nothing more is done, and the arsenic with it. Speaking generally, that cannot be regarded as any other than negligent practice where this is neglected. By this careful method I seldom have any trouble attending the destruction of pulps, and I regard my nerve cases as among the most satisfactory results of my practice. Occasionally I find a little periosteal inflammation and suppuration, but the trouble is slight and transient, and is generally confined to those whose system is depressed by their excesses or other debilitating causes. The mouths of my patients are generally as healthy around a devitalized tooth as around those whose pulps are intact. No unsightly, offensive and troublesome abscesses exist, such as so often proclaim the incompetence or unfaithfulness of the operator; nor am I mortified by the terrible immediate periosteal inflammation which I have seen attend inconsiderate tampering with the pulp and

pulp canal; but clean and healthy gums and alveoli reward a tolerable amount of patience and fidelity, or exemplify the extent to which these virtues may compensate an indifferent ability.

Whilst upon this subject, I would allude to the conviction which has generally obtained, that the necessity of employing arsenious acid for the purpose under consideration has not yet been destroyed by any method of capping by which it has been hoped to save nerves alive. It is due to my friend Dr. Atkinson to say, however, that the employment of oxychloride of zinc, which, as far as I am aware, he was the first to recommend for this purpose, has in my hands come nearer to that object than any other substance I have ever used. I have been surprised and gratified at the results obtained in the mouths of young persons, though for adults it is utterly unreliable.—*Dental Miscellany.*

ARTICLE VII.

The Styloid Muscles and Anæsthetics.

BY G. W. COPELAND, M. D., BOSTON.

Anæsthetics have of late received a large share of consideration from the medical profession; yet so long as deaths occur from their use, it is evident that there is a fault, either in the drug or in the manner in which it is administered. Chloroform has been disposed of for the present, on the ground that it contains a poisonous ingredient liable, under any circumstances to produce death. Ether is more fortunate, for it has escaped censure.

Every medical man is familiar with the fact that, at a certain stage of anæsthesia, the breathing frequently becomes irregular and obstructed by what is termed "the tongue falling back in the throat." Let us look for one moment at the way in which the drug is invariably administered.

The patient, whether sitting in a chair, or lying in the recumbent posture, has his head tilted back, and is requested to open his mouth and "breathe hard." Now see what follows. So long as voluntary efforts on the part of the patient continue, all goes on well; but when unconsciousness takes place, the breathing then involuntary, becomes impeded and oppressed. Several devices are immediately resorted to, such as drawing the tongue out with a tenaculum, a pair of forceps, or, as I recently saw in one of our hospitals, by a ligature passed through it and held by the fingers of an assistant. These procedures generally help, but seldom wholly relieve the difficulty, so that the unconscious effort of the patient struggling for breath continues a source of anxiety to the assistants, and often to the surgeon.

Having occasion to use ether quite frequently, and many times with no other help than the friends of the patient, I have at times been greatly troubled and embarrassed by the occurrence of this state of affairs. Failing, one day, to relieve the trouble by the usual plan of drawing the tongue out, I tilted the head forwards, closing the mouth, and established free and regular respirations through the natural channel, the nose. Since that time, I have repeatedly relieved the difficulty in this simple way.

Let us see what happens when the head is tilted back in the usual position. The styloid muscles are put on the stretch. The stylo glossi draw the tongue backwards, the stylo-hyoidei draw the os hyoides upwards, and the stylo-pharyngei raise the pharynx and thyroid cartilage upwards, all thus uniting to close the epiglottis. Pulling out the tongue will partially overcome the action of the stylo glossi, while the other muscles still maintain their action.

Now see what takes place when the head is tilted forwards. The styloid muscles are all relaxed, the tongue falls forward in the mouth, and the larynx falls into its proper place, thus leaving the epiglottis free, and the glottis unobstructed.

Here, then, I claim, is the secret of preventing or relieving this trouble with the breathing. So soon as the patient

becomes in the least unconscious, tilt the head forwards, and make him breathe through the nose, which certainly was made for that express purpose. It seems nothing more than fair that we should give our patient, when unconscious, the benefit of having his head in a natural position, or at least in the position which he maintains when conscious.—*Boston Medical and Surgical Journal.*

ARTICLE VIII.

The South Carolina State Dental Association.

This association held its annual session in the city of Charleston, on the 16th, 17th, 18th and 19th of June. The meeting was the most successful and interesting of any held since its organization, and in point of representation, the most numerous; and resolutions were offered to have the proceedings published as soon as they could be compiled for the purpose. A bill was framed to be presented at the next session of the Legislature of the State, to regulate the practice of dentistry in South Carolina.

Many interesting papers were read and discussed, and some new ideas eliminated. The following officers were elected to serve for the ensuing year:

President.—Theodore F. Chupein, Charleston, S. C.
1st Vice President.—G. F. S. Wright, Pomaria, S. C.
2nd Vice President.—M. Bissel, Camden, S. C.
Corresponding Secretary.—C. C. Patrick, Charleston, S. C.
Recording Secretary.—J. W. Norwood, Greenville, S. C.
Treasurer.—T. W. Bonchier, Chirard, S. C.

J. W. NORWOOD, *Recording Secretary.*

EDITORIAL, ETC.

A New Method of Extracting Temporary Teeth.—The editor of the *Missouri Dental Journal* is responsible for the following:

"Among the many useful little articles which it is always convenient to have at hand in a dental office, is small rubber tubing, in sizes from an eighth to a fourth of an inch. The uses to which it is adapted, viz:—as a means of separating teeth, holding the rubber dam on the molars or other teeth when central cavities are to be filled; as a dam, in connection with the napkin or bibulous paper when the Barnum dam is not at hand. In correcting irregularities of the dental arch its use in various ways has suggested itself to the intelligent dentist. For this purpose it is an indispensable article with us; in fact we feel that we might say, without fear of successful contradiction, that any irregularity of the arch, no matter how great, can be corrected by a proper use and application of these little rubber rings and the silk ligature. But we have now to record a new use for this useful little article, namely, the extraction of the deciduous teeth. Some of our readers may perhaps know from sad experience the effect of leaving a rubber ring for a day or two surrounding the neck of a tooth. If it was an incisor or canine, you had the mortification of seeing your patient return with a very sore tooth, which was gradually being drawn from its socket. We have had a little experience of this kind, and it has taught us useful lessons. We have learned from it never to leave, for a moment, a rubber ring on a tooth which we did not desire to extract, without having a ligature passed through it to remind us of its presence. And again, if we desired to extract a deciduous molar for a timid child the rubber ring furnished the most convenient and ready means of doing it without pain, and to the great surprise and gratification of our little patient. All we found to be necessary in the case was to slip one of the

rings over the tooth, force it gently under the gum and dismiss our patient with the injunction not to remove it. The tooth would gradually loosen and finally fall out, the rubber ring having surely, silently, and painlessly done the work of the dreaded forceps."

The above reminds us of a case which occurred in the practice of a dental practitioner of this city some years ago, where a valuable tooth was destroyed by a band of rubber, which had been adjusted to its neck for the purpose of arresting the mucous secretion of the gums during the operation of filling an approximal surface cavity, being permitted to remain through carelessness, after the patient was dismissed. When the tooth was removed, which could have been done with the fingers, so loose was it, the rubber band was found tightly embracing the apex of the root, having gradually made its way to this point from the neck of the tooth.

Poisoning from Corrosive Sublimate Generated in the Mouth from Amalgam Fillings in the Teeth.—A writer under the name of F. Payne, D. D. S., contributes the following article to the *Chicago Medical Journal.* From his extreme view of the subject we take it for granted that no such material as amalgam ever enters his dental office.

"Having been invited by an eminent gentleman of the medical profession to attend a convention of the State Medical Society to submit to its consideration a matter of vital importance to the human family, and being unable to comply with the invitation, I have written this article to lay the matter before the medical profession and ask its co-operation.

The matter which I wished to bring to the notice of the profession is the poisoning of thousands of people all over the world, from corrosive sublimate generated in the mouth from amalgam plugs in the teeth. Neither Asiatic cholera, nor smallpox, nor any malarious disease, is doing half the mischief in the world that is being done by this poisoning. Every medical man of any considerable practice has undoubtedly had numerous cases of it, but never knew what it was. The symptoms are so numerous and varied in different cases that it would be impossible

to give them all in this short article, but I will say that a person poisoned in this way is liable to be treated for dyspepsia, neuralgia, paralysis, consumption, and numerous throat diseases. The patient gradually wastes away as if going into a decline, and no medicine will afford any relief. In many cases the difficulty steals on so gently as not to excite the least alarm, and continues very gradually for a number of years till the patient becomes a total wreck; while in others the attack comes on violently, and the friends and the attending physician think the patient is dying; but he will again rally, and again be prostrated.

There is such a resemblance in the symptoms to nearly all the diseases to which human flesh is heir that the physician is led to treat the patient for some disease which seems to be a very clear case, but his patient gets worse. In more than twenty cases that I have had, nearly all had been pronounced by some physician as having consumption. In nearly all the cases there are at times a very bad cough, eyes sunken, and haggard expression and deep blue or dark color under the eyes, invariably a metallic taste in the mouth, water flowing from the mouth in the night while asleep so as to wet the pillow, and in most cases extreme prostration.

I have not time now to detail the manner in which the corrosive sublimate is formed in the mouth, further than to say that the quicksilver in the plugs is driven off by the heat of the mouth in very minute particles, and, combining with the chlorine in the fluids of the mouth, or any saline substance, such as our food, passes into the stomach, and produces slow poisoning. If the State Medical Society will appoint a committee to visit this place, I will show them several cases that will place the matter beyond controversy.

There are some twelve thousand dentists in the United States doing a wholesale business at this poisoning, and I ask the cooperation of the State Medical Society, as guardians of the public health, to assist in getting an act of Congress passed making it a penitentiary offence to place any poisonous substance in teeth that will injure the people."

MONTHLY SUMMARY.

Solubility of Arsenious Acid in Alcohol.—Liquid for the preservation of Anatomic Specimens.—By Dr. G. Mehu.—For about two years, I have prepared large quantities of an antiseptic liquid for the conservation of anatomic specimens at Necker Hospital; after many trials, I have adopted the following formula, giving very satisfactory results.

This liquid is slightly alcoholic, therefore it does not contract soft tissues (generally the bladders of those troubled with calculi or affections of the prostrate) for the preservation of which it is applied; it is sufficiently rich in arsenious acid to prevent their softening and their decomposition. Furthermore, in order to prevent more surely the development of cryptogamic vegetations so often observed in arsenical solutions weak in alcohol, I have added 1 part of crystallized phenic acid to 100 of liquid.

The preparation of this liquor led me to a practical observation, which I was far from looking for: it is this: concentrated, boiling alcohol dissolves easily and rapidly powdered arsenious acid, and in such large quantities that I regard this mode of solution as incomparably more advantageous than the employment of boiling water. Those who have had to dissolve arsenious acid for medical use, (Boudin's liquor and others) know how slow that solution proceeds, and how difficult it is to make the more coarsely powdered particles disappear. The result of this observation is at present confirmed by more than fifty trials, made every time with 200 and 300 grammes of arsenious acid dissolved by alcohols of different degrees, and at different temperatures; this investigation being much more complicated than would appear at first sight, will be the object of future study.

The substitution of an alcoholic liquid for water, as solvent, has moreover another advantage: it permits to operate in a glass capsule, over a bath of boiling water, or at a temperature near it, which avoids all attention, all loss and all projection of a dangerous liquid.

The formula for this conservator liquid is as follows:

Arsenious Acid, - - - -	20	grammes.
Phenic Acid, cryst., - - - -	10	"
Alcohol, - - - - -	300	"
Distilled Water, - - - -	700	"

I place the arsenious acid in a glass capsule, add the larger part of the alcohol, and about a third of the water; place the capsule over a bath of boiling water, (any iron pot over an ordinary stove,) when the arsenious acid disappears promptly, only the more coarsely pulverized pieces remaining. I decant and filter the liquid, which I dilute immediately with boiling water to prevent the deposit of the arsenious acid, which would take place on cooling. The small quantity of arsenious acid remaining undissolved is added to the alcohol and water and subjected to another ebullition. To 100 parts of this arsenical liquid I add 1 part of crystallized phenic acid, previously liquified by gentle heat; I agitate the whole, in order that the solution may become homogeneous.

What has been said shows that it is advantageous to employ the arsenious acid finely pulverized, in order that the process may proceed more rapidly.—*The Pharmacist.*

Nickeling.—In answer to numerous inquiries, writes Mr. S. P. Sharpless in the *Boston Journal of Chemistry*, I again give a brief description of the process of nickeling. The patent is still before the courts, and no decision has been reached in regard to it.

The double sulphate of nickel and ammonium, which is the salt that is generally used, may now be had in commerce almost pure. It is manufactured on a large scale by Joseph Wharton, of Camden, N. J., who controls the nickel market in this country. Cast nickel plates for anodes may be obtained from the same source. The anodes should considerably exceed in size the articles to be covered with nickel. Any common form of battery may be used. Three Daniel's or Smee's cells, or two Bunsen's, connected for intensity, will be found to be sufficient. The battery power must not be too strong, or the deposited nickel will be black. A strong solution of the sulphate is made and placed in any suitable vessel; a glazed stoneware pot answers very well if the articles to be covered are small. Across the top of this are placed two heavy copper wires, to one of which the articles to be covered are suspended; to the other the anode. The wire leading from the zinc of the battery must then be connected with the wire from which the articles are suspended, the other battery wire being connected with the anode.

In order to prepare the articles for coating, they must be well cleaned by first scrubbing them with caustic soda or potash to remove any grease, and then dipping them for an instant in *aqua regia* and afterwards washing thoroughly with water, taking care that the hand does not come in contact with any part of them. This is accomplished by fastening a flexible copper

wire around them, and handling them by means of it. The wire serves afterwards to suspend them in the bath.

If the articles are made of iron or steel, they must be first covered with a thin coat of copper. This is best done by the cyanide bath, which is prepared by dissolving precipitated oxide of copper in cyanide of potassium. A copper plate is used as an anode. After they are removed from the copper bath, they must be washed quickly with water and placed in the nickel bath; if allowed to dry or become tarnished, the nickel will not adhere.

Great care must be used through the whole process to keep all grease, dust, or other dirt from the articles to be covered, or else the result will be unsatisfactory. The whole process is one of the most difficult that is used in the arts, it being far easier to gild, plate, or copper an article than to nickel it; but if due care be taken, the results will amply pay for the trouble.—*Druggists' Circular.*

Large Calculus.—The following account of a calculus of gigantic magnitude is copied by a Mr. Gouge, from the preface to an old book of sermons by the Rev. Nicholas Byfield, of Isleworth, who lived in the time of Queen Elizabeth and James I. The book was published, after his death, by the editor, Mr. Gouge, to whom we are indebted for the details of this remarkable case, and is dated 1623.

"It appears that he carried a torturing stone in his bladder fifteen years together and upward. I have heard it credibly reported that, fifteen years before his death, he was by a skillful chirurgeon searched; and that, upon that search, there was a stone found to bee in his bladder; whereupon hee used such means as were prescribed to him for his case, and found such help thereby as he thought; that either the chirurgeon which searcht him was deceived; or that the means which he used had dissolved the stone. But time which manifesteth all things, shewed, that neither his chirurgeon was deceived, nor yet his stone dissolved; for, it continued to grow bigger and bigger, till at length it came to bee of an incredible greatness. After his death, hee was opened, and the stone taken out; and being weighed, found to be 33 *ounces and more in weight*; and in measure about the edge *fifteen inches and a halfe:* about the length *above* 13 *inches;* about the breadth, *almost thirteen inches;* it was of a solid substance; to look upon, like a flint. There are many eie-witnesses besides who can justifie the truth hereof. A wonderful work of God it was, that he should bee able to carry such a stone in his bladder, and withall to do the things which he did."—*British Medical Journal.*

On Iodoform as a Topical Remedy.—Dr. Courteaux (*Annales de Dermatologie et de Syphiligraphie*, vol. v. 1873–4) gives a summary notice of two recent works by Petiteau and Isard on the use of iodoform. Petiteau's conclusions, which, Dr. Courteaux says, agree with his own and those of several surgeons at the Midi Hospital of Paris, are as follows:—

1. Iodoform is locally anæsthetic.
2. When dusted on ulcerating surfaces, it causes them to cicatrize rapidly.
3. It is most useful in small atonic wounds, or such as tend to creep or enlarge, soft chancres, suppurating buboes; syphilitic, varicose, scrofulous, and cancerous ulcers.
4. It is the surest remedy to procure a prompt cicatrization of syphilitic ulcers of all kinds.
5. It may be applied as an ointment, or as a solution in glycerine and alcohol, and in these forms is preferable to the powder when there is abundant suppuration.
6. It should be always accompanied in syphilitic affections by internal treatment.

Petiteau attributes its good effects to the simplicity of the dressing, to its antiseptic power, and to the absorbent property it possesses as a powder, and to its giving off iodine freely.

Isard, while agreeing with many of the conclusions of Petiteau, maintains that phagedæna is not controlled by iodoform.

The results of some comparative experiments made by Mr. Berkeley Hill on soft venereal sores and on creeping tertiary syphilitic sores with iodoform and other applications, corroborate Isard's conclusion concerning the feeble power of iodoform to arrest certain obstinately spreading sores. The early venereal sores were in seventeen out of twenty cases not at all controlled by iodoform; and, though more efficacious with tertiary ulcers, it was not uniformly effectual.—*London Med. Record.*

Remedy for Toothache.—Having spent a number of years of my professional life in the country, where no dentist was near, and therefore being often called to prescribe for toothache, I tried many combinations of drugs, and many published formulæ, with more or less satisfaction to myself and patients. But several years since I hit upon the following combination, which I have found better than any I have ever used, and it will give relief in almost all cases where such a remedy is applicable:

℞ Carbolic acid, saturated solution; hydrate of chloral, saturated solution; camphorated tincture of opium; fluid extract of aconite, of each an ounce; oil of peppermint ½ oz. M.—Apply by saturating a pledget of cotton (or preferably a small piece of sponge), and pack closely into the cavity of the decayed tooth. —*Dental Cosmos.*

A French Charlatan.—An irregular practitioner was recently fined at Brest, for practicing without a diploma. He was a retired naval officer who had found means, during several years, to increase his income by the sale of tiny bits of sugar steeped in liquids, for the nominal sum of fivepence each. He called himself a homœopath, and openly visited patients, and gave consultations, charging the same fees as the medical men of Brest. This was no vulgar and illiterate impostor, and his success was the greater as he was a superior naval officer, and always gave his consultations in full uniform.—*Med and Surg. Reporter.*

The Use of Iodic Acid by Hypodermic Injection.—For some time the hypodermic syringe has been used to introduce fluids into the centre of glandular tumors. Lately Dr. Luton, of the Rheims School of Medicine, has drawn attention to the remarkable success he has had in the dispersion of glandular and other tumors by the use of iodic acid thus applied. Goitres have been so treated, the solution he uses being about one-fifth acid, the balance water. A sharp local action at once occurs, but he has seen no inconvenience follow, and the resolution of the tumor has finally been effected without suppuration.—*Med Press and Circular.*

The Prevention Cicatrices.—In the Military Hospital of Constantinople, I attended a soldier cook, with an extensive scald in the third degree, on the right arm, forearm, and side. After the healing of the wound, the forearm was close to the arm in such a way that all the extension above the length of the fingers in flexion was impossible, the fingers in this position reaching the deltoid. The nodular tissue extended over four-fifths of both arm and forearm.

To overcome the difficulty of motion I have proceeded in the following manner: With a *trois-quart explorateur* I made a series of perforations through the whole length of the cicatricial tissue at the distance of two or three lines from each other. In each of these holes I introduced a silver wire of a good size, and left it in place. When those openings were healed, I made an incision through the whole cicatrix, following the line of the artificial openings. I placed the arm in extension, where it healed, and I obtained a complete success —*Dr. Andre's Clinic.*

Death from a Dose of Chloral and Bromide of Potassium.—The Cincinnati *Clinic* reports the death of a physian of that place from having taken at one dose a mixture containing one-half oz. of bromide of potassium, and one drachm of chloral.

Bone and Skin Grafting.—M. Howse, recommends in cases where suitable grafts cannot be obtained from human sources, to use the mucous membrane from the lips of guinea-pigs or rabbits; he has succeeded in such cases, and advises that rabbits fresh from the country pastures be selected. Not only have skin grafts from animals succeeded, but M. Reverdin gives an illustration of the case of a Russian gentleman from whose cranium a Tartar had sliced a piece by a sabre cut; the loss was supplied by a fresh piece from the skull of a dog, and the graft succeeded completely.—*L' Union Medicale—The Clinic.*

Trichinæ.—At Harrisburg, Pa., June 1, a post-mortem examination was made of the body of George Cordes, who died from eating ham containing trichinæ. Under the microscope thousands of trichinæ were visible, sixty-five being counted in the space of an eighth of an inch; and the whole body doubtless contained millions. Cordes suffered terribly before death.—*Medical and Surgical Reporter.*

Death from Lancing of the Gum.—In the *American Medical Journal*, for April, are given the particulars of the death of a child fourteen months old, from hæmorrhage occasioned by the lancing of the gum over a molar tooth. The blood oozed from the divided gum for three days, in spite of all efforts to suppress it. The child was well developed, and healthy from birth, and no previous suspicions had been entertained of the existence of a hæmorrhagic diathesis.—*Boston Med. and Surg. Journal.*

Lusus Naturæ.—Dr. W. H. Bent, of Argyle, N. S., reports the following peculiar case of monstrosity occuring in a child whose parents reside in Pubnico. It has three legs in perfect use, two complete sets of sexual organs (male); two perfect arms, and two imperfect ones—the latter growing from the middle of the back and curving in a line with the lower ribs. The head is finely developed, and what appears to be a second one is situated half way down the left side of the neck. It is considered a great wonder among the French Acadians.—*London Medical Record.*

Methyl-bichloride.—This anæsthetic is being used at the St. John's hospital with the best of results, and so far it seems to possess many advantages over both chloroform and ether.—*Mo. Clin. Record.*

RUBBER.

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ARTICLE I.

Sixth Annual Session of the Southern Dental Association.

The sixth annual session of the Southern Dental Association assembled in the hall of the Polytechnic Institute, St. Louis, at 10 o'clock A. M., Tuesday, July 28th.

Dr. Robert Arthur, of Baltimore, president of the Association, called the meeting to order, and the exercises were opened with prayer by Rev. Dr. Linn, of St. Louis.

On the conclusion of the prayer, Dr. Isaiah Forbes delivered the following address of welcome:

Gentlemen of the Southern Dental Association:—In behalf of the dentists of St. Louis, I am called—not because of especial qualification, but as their senior in years—to the pleasant duty of welcoming you to this city. But not only in their behalf do I extend to you a cordial welcome; here are students in other branches of science who greet you as brothers. Here in this hall, the Academy of Natural Sciences, the Medical Society, the Historical Society, the Microscopical Society, and other kindred bodies, hold their meetings; and their respective libraries and museums, well worthy of a special visit; with the library of the Public School Association in this building, and by Mr. Bailey, the librarian, placed at your disposal during your stay. The

Mercantile Library Association, through its librarian, Mr. Dyer, has extended to you the free use of its extensive and valuable collections.

The press, zealous champion of truth and fearless antagonist of error, offers its columns for the publication of your proceedings, and heartily welcomes you to the city. And the powerful body of merchants, known by their enterprise to the furthest limits of this country, give you a cordial greeting. Manufactures, at once the pupil and servant of science, will invite you to observe in foundery or factory the wonderful progress of a city destined soon to equal, if not surpass, in its industry any other on this continent. In a word, St. Louis welcomes you with pleasure.

Thirty years ago a mere river town of 20,000 souls, and now a growing city of half a million inhabitants. It will be the aim of your professional brothers in this city, whereever your duties permit, to show you its beauties and objects of interest, and to make your visit one which I trust you will not be unwilling to repeat.

Permit me to add that the charms of scientific inquiry at these meetings are enhanced to me, at least, by the delight of personal intercourse. At the national convention of dentists, which met at Hope Chapel, New York, I met for the first time, many from whose unfailing fountains of thought I had for years gladly refreshed myself.

As star answers to star acro-s the wide expanse of the heavens, so each student in any branch of science, though widely separated from others of kindred pursuits, sends from his closet the rays of thought, the fruits of discovery, the records of experience, which other students far away hail with gladness, and like the stars the true followers of science send forth their rays of truth generously and ungrudgingly, glad if they reach not only worthy students of honest inquiry, but some darkened and rayless humbugs as well, who are thus enabled to shine a little with borrowed light.

In ours, as in other branches of science, the true student seeks the well-being and happiness of mankind. Not for any promised gain does he seek to hide the discoveries he makes, but, on the contrary, by associations such as this he gladly imparts them as freely as possible to others who may use them for the happiness of men. And in these gatherings we gain, not only by the interchange of thought, but by personal influence and example of our noblest associates. How great and lasting is that influence we rarely realize. The man of knightly fidelity and lofty patience never fails to leave his impress.

Often when operating we meet vexatious difficulties, which to me, as doubtless to others, are sometimes trying to the temper; defective instruments or foil, a nervous patient, weariness in the patient or myself have sometimes strained my self-control to the utmost. But if I turn my head, and see upon my walls the portrait of Dr. Arthur, its benignant expression soothes like magic; the recollection of your lofty patience, sir, calls back my wavering mastery of weary nerves, and I resume my task with comfort and success.

Gladly, gentlemen, in behalf of my professional brethren, and in behalf of this solid city, I have the honor to welcome you, and trust your visit may prove both profitable and agreeable.

This address was cordially responded to by President Arthur in behalf of the Association, expressive of its high appreciation of the kindness extended to it, and the hope that the workings of the convention might redound to the general welfare of the profession.

The roll was then called, and the following members answered to their names:

Dr. Robert Arthur, Baltimore, President; Dr. James Johnson, second Vice-president, Staunton, Va.; Dr. Jas. F. Thompson, Recording Secretary, Fredericksburg, Va.; Dr. S. J. Cobb, Nashville, Tenn.; Dr. A. P. Gore, Baltimore, Dr. S. H. Henkel, Staunton, Va.; Dr. Jas. S. Knapp, New Orleans; Dr. W. H. Morgan, Nashville, Tenn.; Dr. W. N. Morrison, St. Louis; Dr. W. G. Redman, Louisville, Ky.; Dr. J. R. Walker, New Orleans; Dr. W. T. Arrington, Memphis, Tennessee.

On motion, the reading of the minutes of the last meeting was dispensed with, they having been published in the proceedings of the Association.

Dr. Robert Arthur then read a lengthy essay on the present condition of dental science and the best means of advancing its true interests. He deprecated the idea that seemed to prevail in medical colleges and among medical gentlemen generally, that dentistry was merely a mechanical occupation, and that the dental profession knew no more about diseases of the teeth than they did. He considered dental surgery as one of the highest specialties in the great art of medicine. True, a great portion of the work of a dentist depended upon mechanical dexterity. No knowledge of physiology, chemistry, or therapeutics is of the slightest use to render a man fitted to perform the operation

of filling teeth. Let an individual have natural or acquired manual dexterity, and he has appliances and material of such superior quality on hand that he can readily be taught to perform many of those operations in an entirely efficient and satisfactory manner. For many of the simplest operations of filling teeth, but little mechanical ability is required, and even for the very best operations a certain amount of manual dexterity, patience, perseverance, and careful attention to detail will go far towards accomplishing good results.

The extraction of teeth does not require, as is generally supposed, any medical knowledge, nor even an acquaintance with the anatomy of the parts concerned. There is very little risk of breaking the jaw, as was formerly supposed to be likely to happen in the hands of an unskilful operator.

But the better class of those engaged in dental pursuits, take a broader and more elevated view of their calling than these mechanical operations, and consider it worthy of a higher rank than simply that of an artistic calling.

First. It is concerned with the care, locally, of important parts of the organism, more subject to diseased conditions than any other, many of which are extremely painful, and some of the gravest character.

Second. The effect of diseases of the teeth are not confined to themselves nor to important parts adjacent thereto, but in many cases seriously affect the whole system, not unfrequently leading to great suffering, to general disorder, and to the abridgment of life. On the other hand certain conditions of the general system seriously impair the healthy condition of the teeth.

Third. So far as general disorder is occasioned by the teeth, the diseased condition of the latter deserve special attention and study.

The speaker deduced from these propositions that medical men are ignorant of the pathological conditions of the teeth, except in a superficial degree; that they give too little attention to the influence of the teeth upon the general system, and that it is important to the interest of the community that there should be a class of medical specialists capable of estimating fully the influence of diseased teeth upon the general system, and *vice versa.*

Drs. S. H. Henkel, James S. Knapp and W. H. Morgan, were appointed a committee on membership, to report at the afternoon session.

Dr. W. G. Redman, of Louisville, was appointed secretary pro tem.

Dr. J. S. King and Dr. R. R. Freeman, of Nashville, and Dr. Welchens, of Pennsylvania, presented their credentials, and were admitted to seats.

Dr. James Johnson, of Staunton, Va., offered the following which was adopted:

Resolved, That a cordial invitation be extended to the dental and medical professions of the city and surrounding country to occupy seats on the floor during the meetings of this Association.

Dr. Walker, of New Orleans, offered a resolution fixing the hours of meeting, but the question was laid over until the afternoon session, and the convention adjourned until 2 o'clock.

AFTERNOON SESSION.

At about half-past 2 o'clock the afternoon session opened, the same members as in the morning being present.

The first order of business being the settlement of the question as to hours of meeting, the executive committee recommended the following: For the first two days, clinics and examination of dental appliances. Morning session from 10 to 12, afternoon session from 2 to 6, evening session from 8 to 10. For the remaining days, clinics from 8 to 10, morning session from 10 A. M. to 2 P. M., evening session from 8 to 10. These hours were considered good, and were adopted as the choice of the Association.

A communication from Messrs. Geo. Knapp & Co., inviting the Association to visit the *Republican* office and witness the operation of the Walter press, was read, and the invitation accepted.

An invitation from Mayor Brown, for the Association to take an excursion upon the harbor boat, on Thursday afternoon, for the purpose of visiting the Vulcan Iron Works, Water Works, and other features of interest, was also read and accepted.

The committee on mechanical dentistry also made its report in the form of an exhaustive paper on the subject of the manufacture of teeth. It set forth that sets of teeth manufactured of cheap material were always the most costly in the end, and that any dentist who recommends to his patients an article of this kind, is not doing his duty as a professional man. Collodion was recommended as being by far the best and most satisfactory base that can be used. The paper went on to insist that more time and labor be given to experiments and investigations in the laboratory,

as at present the science is greatly dependent for its progress on the works of men who have no connection whatever with dentistry, and who cannot, of course, take that interest in the branch that a professional would.

The report was accepted and filed among the records of the Association.

Dr. Walker, of New Orleans, stated that he had always been an uncompromising opponent of the use of rubber as a base for artificial teeth, and another year's experience had only confirmed him in his opinion on the subject. He preferred collodion above all other materials for that purpose.

Dr. Welchens, of Pennsylvania, stated that he and his friends had attended this Convention for the purpose of learning the opinions of the Western dentists on the use of rubber as a base. The dentists in this part of the country have found it impossible to entirely give up the use of rubber, but its use has certainly driven science out of the laboratory, by admitting to the practice of mechanical dentistry unskilled and inexperienced persons, it requiring no long experience or skill to enable anyone to make a comparatively good job on a rubber base. This state of affairs results in a great slaughter of the teeth, and has reduced the prices of dentistry to an unpleasantly low figure. For these reasons the use of rubber is undesirable, but at the same time it is absolutely impossible in some portions of Pennsylvania to do without it. People having been educated to the use of cheap rubber sets, it is a very hard matter to convince them that gold and silver bases are so much more desirable as to warrant the great increase in price. Hence, an operator in Pennsylvania must be prepared to work on all the different materials, else he will loose a large portion of his patronage.

The committee on membership reported favorably upon the following named applicants for admission to the Association, and they were all elected by a unanimous vote: H. Judd, M. D., D. D. S., St. Louis, Mo.; H. J. McKellops, D. D. S., St. Louis, Mo.; R. J. Porre, D. D. S., St. Louis, Mo.; J. B. Newly, D. D. S., St. Louis, Mo.; F. Forbes, D. D. S., St. Louis, Mo.; C. Stoddard Smith, D. D. S., Springfield Ill.; R. E. McReynolds, D. D. S., Macon, Ga.; M. A. Bartleson, D. D. S., St. Louis, Mo.; W. H. Eames, D. D. S., St. Louis, Mo ; Jas. Knapp, D. D. S., New Orleans.

After five minutes recess to allow the newly elected members to sign the constitution, the discussion of mechanical dentistry was resumed.

Dr. Morgan, of Nashville, stated that his observations as to the effect of a rubber base upon the mouth did not agree with those of Dr. Walker. He did not believe that it injured the mouth any more than silver, and even gold had a very slight advantage over it. In support of this he exhibited his own mouth, which, although it had worn rubber for nearly two years, he declared to be perfectly sound.

Dr. Walker replied that he had given the matter much and close study, and was satisfied that his position was correct. His own wife had worn rubber for three years, and the effect was to ruin her health. He was not convinced that this was the cause until he tried an experiment upon his own mouth with a like effect. By watching the effects of the same agency in numerous cases, he placed the matter beyond all doubt. Almost universally he noticed that it not only made the mouth sore, but it had such an effect upon health, as to reduce the weight of the person very considerably, the person returning to his normal condition as soon as the cause was removed. He gave some of the symptoms of the disease produced, but stated that he had never analyzed the rubber after vulcanizing to ascertain the deleterious effects.

Dr. Judd stated that the question was one of great importance to the entire world. He had given the effects of rubber a great deal of attention ever since the first cry was raised against it. He had found that the red rubber plate is far more injurious than black rubber, and cited an instance in which the two rubbers were mixed, the part touched by the black being comparatively healthy, while that touched by the red rubber was greatly irritated, and even inflamed. He knew of several cases where the disease had extended to even the bones of the mouth, completely destroying them. While he believed that in different climates the degree of injury may vary, he was satisfied that red rubber always produces more or less irritation, inflammatory action, or disease. He had seen a number of cases where the mouth was greatly diseased by rubber plates, and when metal plates were substituted the parts recovered their healthy condition. Why should not red rubber have this effect? Let any one, no matter how healthy, place a small quantity of red sulphuret of mercury in his mouth and allow it to remain for a while, and he will find the parts to become almost immediately affected. The red sulphuret of mercury cannot be covered up by the ingredients of red rubber so as not to have this deleterious effect. With black rubber he had not

had such an extensive experience, but he was satisfied that it had not such severe effect as red rubber.

Dr. Johnson said his experience agreed exactly with that of Dr. Judd. He had seen some very serious cases of disease which had arisen from red rubber, and he has seen one or two cases of several years' standing, which were cured by simply substituting a metal for a rubber plate. He had years ago given up the use of rubber entirely, and would never return to it.

Dr. Knapp agreed that rubber should not be used for permanent plates, but held that sometimes it is necessary for irregular teeth, and for temporary plates. He had also found that red rubber was far more deleterious than black rubber. He could not understand, however, how the mercury could be released from the saliva to such an extent that it brings on disease.

Dr. Morgan stated that he believed that the majority of diseases of this nature arise, not from the material of the plates, but from carelessness or uncleanliness on the part of the wearer. He had known of a number of cases of very serious disease in mouths where gold plates were used, and in one of these he had substituted a rubber plate with most gratifying effects. In the cases mentioned by the gentlemen who recently spoke, it is not impossible that if the plates had been silver or gold instead of rubber, the disease would have been much worse.

Dr. Cobb, of Nashville, believed that disease arises more from the fact of a foreign substance being in contact with the mucous membrane than from the nature of that foreign substance. He admitted, however, that there are more cases of disease with rubber plates than from silver or gold. He deplored the apparent lack of disposition to investigate this matter to the fullest extent. He would be glad that some member had so far studied the matter as to be able to give the component parts of vulcanized rubber, which being done the cause of disease could be more readily arrived at. He did not think it advisable to reject rubber altogether, however, until some scientific analysis has absolutely proven it to be the promoter of disease. So long as there are poor people, we will need a cheap substance for the manufacture of bases for teeth, and if rubber is proven to have nothing in it of a deleterious nature, then it is truly a blessing to the profession.

Dr. Arthur agreed that the cases of disease where red rubber is used, are more numerous than where any other ma-

terial is worn, but he also regreted that with all the appliances so convenient, this matter has never been scientifically investigated. He, therefore, moved that a committee be appointed with instructions to subject vulcanized rubber to a chemical analysis, and to report at the next meeting. The motion carried, and Drs. Judd, Eames and McKellops, of St. Louis, and Dr. Summers, of Nashville, were appointed as members of that committee.

Dr. Knapp said that another cause for disease might be found in the fact that, where rubber is used, the mucous membrane is more perfectly or entirely covered than where metal is used, hence the inflammation is greater.

Dr. Forbes said that he considered that very often the effect of the plate depended upon the physical idiosyncracies of the person wearing it, and often the fact that some of the teeth have metal fillings, on which the mercury in the rubber acts, explains the disease. He deprecated the common custom of denominating low-priced articles as "cheap." With him, that which serves the best purpose, no matter what its price, is cheapest. He hoped that hereafter the "white" members of the profession would drop this improper use of the expression.

The subject was then dropped.

A letter from Prof. McLean, of New Orleans, announcing his regrets that he was unable to attend the meeting, was read and accepted.

The following gentlemen were appointed a committee for the performance of clinical operations at the office, No. 904 Chesnut Street, this morning from the hours of 8 to 10: Drs. Knapp, Arrington and Walker.

The chairman of the histology and microscopy committee was not present, but the written report was received. As it was of a very trying order of chirography, its reading was postponed until to-day, in order to give the secretary an opportunity to practice on it.

A motion to invite all members of the medical and dental profession of the city to attend the meetings of the Association was, after some sharp opposition, lost.

A motion to invite the physicians of the city to the same privileges was also fatally opposed.

Dr. Redmond offered an amendment to the constitution, providing that members shall be required to pay annual dues for only such years as they may attend the meeting of the Association. This provision is to apply from the date of organization. Dr. Redmond said that he had acted as

treasurer for a long time, and he knew that the feeling of a majority of the members favored this proposition.

Some discussion arose in which it was argued that this would be beneficial, in the fact that sometimes members remain away from necessity several years, and then drop out entirely, because to come back would be to have to pay back fees without receiving any benefit therefrom. This change being adopted they would not drop out, and thus the membership would be kept up to a good standard. The amendment was adopted.

Dr. Redmond also moved that the name be changed to "The National Dental Association."

Dr. Morgan said that the necessity which gave rise to the old name has died away, and as the name justifies the common inference that it is a sectional institution, while it is desirable to do away with this idea. Hence he favored the change.

Dr. Johnson opposed the proposition. He held that it would not benefit the Association or increase its membership to make the change. Dr. Redmond said he had been unable to induce any dentists from his State to attend because of the impression that the Association was a Southern one.

The amendment was laid over for discussion at some future year.

Dr. Judd read an essay upon the subject of "Deciduous Teeth," showing that it is just as important to give good care to the deciduous as to the permanent teeth, and that the pain of losing them is, to the little folks, as great as that of losing permanent teeth, to adults. If the deciduous teeth are carelessly treated, and if no efforts are given to preserve them, the result is not only the temporary pain which the child suffers, but in the permanent malformation of the jaw, which contracts on the premature removal of some of the teeth, and results in irregularity of the permanent teeth, and in great injury to health and physical development. He thenwent on to state how deciduous teeth should be cared for while perfect, and the manner of treatment if diseased.

The paper was accepted and ordered published.

Drs. Walker, Knapp, Morgan, and Johnson, and Arthur, heartily indorsed the views of the paper, declaring that almost universally the importance of caring for children's teeth is unrecognized, and that the bad effects of this want of care remain with the child through life. The teeth should be kept scrupulously clean, the interstices should be kept open with the file and disk, and every effort should be used

to preserve the deciduous teeth until they are removed by natural process. The result will always be good health in the child, perfect development of body, and a regular and durable set of permanent teeth.

EVENING SESSION.

The Association met at 8 o'clock, and resumed the discussion of the treatment of deciduous teeth.

Dr. Morgan said that he was opposed to the plan proposed by Dr. Johnson, to the effect that children's teeth should, if very close together, be separated by files or disks. He believed that such a practice would be barbarous. So long as a portion of the body is not diseased, it is not in need of surgical interference. Even if the teeth are close together at first, the natural enlargement of the jaw will separate them.

The committee on members presented the name of Edgar Parks as a candidate for admission to the Association, and he was elected to membership by a unanimous vote.

Dr. Cobb agreed with the views of Dr. Morgan, and thought the plan of separation to be too much of the order of anticipation. He dwelt at length on the necessity of great care in the treatment of children's teeth. He did believe, however, that if any evidences of decay are seen where teeth touch each other, the decayed portions should be cut out.

Dr. Knapp held that to improve the quality of the teeth, we should go back to primary causes, and advise mothers to eat such food during gestation as will contribute to the construction of sound teeth. Again, this same cause of using proper food should be urged upon young children, as the quality of teeth depends upon the kind of food eaten. He, like the other two gentlemen just seated, deprecated the separation of well-formed teeth in children, so long as they remain sound, no matter how close together they may be. He believed in preserving the first teeth as long as possible—by filling, if necessary, in order that the proper shape of the mouth should be retained. The filling employed, if any, should be gold, if it is to remain long, but if the teeth are to be shed soon, amalgam can with propriety be used.

Dr. Freeman, of Nashville, held that to separate teeth with instruments, would be to render the parents of the child careless, as they would think that the dentist has performed an operation which relieves them of all responsibility. He believed in filling a deciduous tooth just as soon as it began to show signs of decay.

RUBBER.

June 23d, 1874.)

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THE

AMERICAN JOURNAL

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DENTAL SCIENCE.

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ARTICLE I.

Sixth Annual Session of the Southern Dental Association.

The sixth annual session of the Southern Dental Association assembled in the hall of the Polytechnic Institute, St. Louis, at 10 o'clock A. M., Tuesday, July 28th.

Dr. Robert Arthur, of Baltimore, president of the Association, called the meeting to order, and the exercises were opened with prayer by Rev. Dr. Linn, of St. Louis.

On the conclusion of the prayer, Dr. Isaiah Forbes delivered the following address of welcome:

Gentlemen of the Southern Dental Association:—In behalf of the dentists of St. Louis, I am called—not because of especial qualification, but as their senior in years—to the pleasant duty of welcoming you to this city. But not only in their behalf do I extend to you a cordial welcome ; here are students in other branches of science who greet you as brothers. Here in this hall, the Academy of Natural Sciences, the Medical Society, the Historical Society, the Microscopical Society, and other kindred bodies, hold their meetings ; and their respective libraries and museums, well worthy of a special visit; with the library of the Public School Association in this building, and by Mr. Bailey, the librarian, placed at your disposal during your stay. The

Mercantile Library Association, through its librarian, Mr. Dyer, has extended to you the free use of its extensive and valuable collections.

The press, zealous champion of truth and fearless antagonist of error, offers its columns for the publication of your proceedings, and heartily welcomes you to the city. And the powerful body of merchants, known by their enterprise to the furthest limits of this country, give you a cordial greeting. Manufactures, at once the pupil and servant of science, will invite you to observe in foundery or factory the wonderful progress of a city destined soon to equal, if not surpass, in its industry any other on this continent. In a word, St. Louis welcomes you with pleasure.

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Gladly, gentlemen, in behalf of my professional brethren, and in behalf of this solid city, I have the honor to welcome you, and trust your visit may prove both profitable and agreeable.

This address was cordially responded to by President Arthur in behalf of the Association, expressive of its high appreciation of the kindness extended to it, and the hope that the workings of the convention might redound to the general welfare of the profession.

The roll was then called, and the following members answered to their names:

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Dr. Freeman would like to see the good portions of this book brought out just as well as its bad points. Doubtless as much acceptable matter could be found in it as has been found objectionable.

Dr. Knapp was of the opinion that there were a great many good things in the book, and it should be in the library of every practicing dentist.

Dr. Cobb thought we were all too apt to find fault with other people's work. The profession was under many obligations to Dr. Arthur for the book.

Dr. Forbes looked upon the book as one of the most fascinating in the annals of dentistry. He would have fallen a victim to this book had he not been taught the abuse of the file. Some time ago it was the fashion for ladies to have their front teeth standing apart. Many a time had he been called to the operating rooms to witness the sad effects of the abuse of the file.

On motion, the subject was postponed until next session.

Upon motion, the convention proceeded to select a place for holding the next annual meeting of the convention.

The first ballot resulted as follows: Nashville, 8; Memphis, 8; Atlanta, 4.

On the second ballot Memphis received 10 votes, and Nashville 11 votes. Whereupon Nashville was declared the place for holding next meeting.

The Excursion.—The convention concluded to proceed in a body, at 2½ o'clock, to the harbor boat, at the foot of Walnut Street, and accept the invitation of the Mayor to make an excursion on the river, and visit the Waterworks, Carondelet furnaces, etc.

Dr. Knapp moved that the time of holding next meeting be set for the second Tuesday in April.

Many of the members found it very inconvenient to attend the convention at that particular season of the year.

The motion was withdrawn. The time was set for the last Tuesday in July.

Dr. Freeman moved that the vote selecting Nashville for the next meeting be re-considered. Carried.

On motion, Memphis was unanimously chosen as the next place of meeting.

Convention adjourned until 8 o'clock.

EVENING SESSION.

The Secretary read a circular on the subject of the Barnum Memorial Fund, which was suggested by the

American Dental Association at its last meeting, at Put in-Bay. The memorial was donated to Dr. Barnum for bestowing on the profession the well known "rubber dam."

On motion, the Association voted $100 to the fund.

The Committee on Publication reported the following accounts to have been made on behalf of the Association:

Messrs J. Murphy & Co., balance for printing,	$ 2 25
Dr. Samuel Welchens, - - - - -	100 00
Total, - - - - - -	$102 25

The report was received and referred to a special committee, consisting of Drs. Arrington, McKellops and Thompson.

Operative Dentistry.—Dr. Knapp was the first speaker. He performed all his operations after the old plan. He was an old fogy. He did not use the rubber dam, yet he did not condemn its use. He used gold in the form of cylinders, and he claimed that just as good work can be done with cylinders as with any other form. The doctor entered into quite a lengthy dissertation upon the manner of placing the cylinders in the cavity of the tooth about to be filled, and the mode of bringing lateral pressure so as to force the cylinders against the walls of the cavity. He claimed that for all ordinary filling this form of gold presented many advantages. He had used cylinders since 1851, so he should know something about them.

Dr. Arthur would say a few words about cohesive gold. This quality of gold has been before the profession for about eighteen years. That this adhesive quality was well known to good-workers for a long period, he had no doubt. This adhesive gold is nothing more than pure gold.

Dr. George S. Peck, of New York, manufacturer of dental gold, explained the qualities of gold. The greatest question was to get non-adhesive gold. The softest gold made is the Eureka gold made by himself. The purest gold is the most adhesive, and is consequently the safest.

Dr. Morgan said he could fill the cavities of teeth with adhesive gold in as short a time as with cylinders. He also took occasion to remark that in order to have gold cohesive it is not necessary to have it pure. He saw gold with six per cent. alloy and still cohesive.

Dr. McKellops did not agree with Dr. Knapp in his ideas on the subject of gold in the form of cylinders. He was of opinion that he could take the adhesive gold, and with it reach every minute cavity of the tooth better than he could

with cylinders. For fine work he preferred foil. The best foil for dental purposes was the roll foil Nos. 30 and 60.

Dr. Cobb, of Nashville, was in favor of the old form of cylinders. He believed that more teeth were preserved in the old way than the new. He also believed that more teeth can now be saved by using non-cohesive gold. Many who think they are making first-class operations are making failures.

Convention adjourned until 10 A. M. to-morrow.

THIRD DAY'S PROCEEDINGS.—MORNING SESSION.

The third day's meeting of the Dental Association was called to order at 10 o'clock A. M. After the minutes of the previous meeting had been read and approved, "Operative Dentistry" was announced as the question for discussion.

Dr. Knapp, of New Orleans, arose and said that he had witnessed that morning an operation in this branch of dentistry, in which machinery was used for grinding out the cavity of the tooth. The doctor stated that the performer consumed an hour at the work, and that he was satisfied it could have been done by hand in fifteen minutes.

Dr. Eames gave his experience with metals used in the practice of dentistry. He preferred gold to all other metals.

Dr. King of Nashville, considered himself discoverer of a new method of treating exposed nerves until very lately. His plan consists of a cap of zinc and creosote.

Several gentlemen spoke of the importance of the method, while others did not exactly condemn it, but looked upon it in rather a doubtful manner.

An amendment to the constitution allowing the Secretary fifty dollars for each sessions work, was adopted.

An amendment offered by Dr. Walker, altering article 7, section 5, of the constitution, was adopted.

Dr. Arthur gave blackboard illustrations of the latest manner of placing the pivot in teeth.

W. G. Kingsberry, of San Antonio, Texas, was admitted as a member of the Association. The Convention then adjourned to meet again at 8 P. M.

EVENING SESSION.

A paper on Histology and Microscopy by Dr. S. P. Cutler was read by the Secretary, the doctor speaking of ossi-

fication of the pulps, and other topics of the same nature. The paper was accepted. Dr. Walker arose and moved that one of the gentlemen present, who was familiar with Dr. Cutler's hand-writing, should read the paper. (Much merriment.) Dr. Arrington asked the gentleman from New Orleans if he'd been asleep, stating that the paper had just been read. The doctor begged to be excused, remarking that he had been to Carondelet during the day. Dr. Judd opened the discussion on the subject, speaking at length of the dental tubuli, of neuralgic affections, and of calification and dentine of the pulp. Dr. Knapp, of New Orleans, spoke of a case where he tried to remove the pulp, and of his investigation on dentine and calification of the pulp. Dr. Winder, of Baltimore, spoke of a case where there was an outgrowth of dentine and of the manner in which it had been treated.

The subject of Mechanical Dentistry was then taken up. Dr. Winder made a few brief remarks on his experience with celluloid, at the request of Mr. I. S. Hyatt.

The following resolutions were offered by Dr. Redman:

Resolved, We, the members of the Southern Dental Association, have had a highly pleasant and very profitable excursion on the river, and to various points of interests, this afternoon: therefore,

Resolved, That our heartfelt thanks are given to Mayor Brown, of St. Louis, for the use of the city harbor boat on the occasion.

Resolved, That we are under grateful obligations to the St. Louis members of this Association for their grand entertainment on the boat, and for numerous courtesies while in the city, especially in providing the steamboat excursion.

Resolved, That our thanks are due to Mr. A. B. Garrison, vice-president of the Vulcan Iron Works, for showing us through his works, where the process of making rails and of running pig iron was seen; to Colonel R. M. Renick, vice-president of the board of water commissioners, for conducting us through the St. Louis waterworks at Bissell's Point, where some of the largest machinery in the United States was seen; and to Captain John Coale, master of the city harbor boat, for his excellent management of the boat in the trip of twenty-eight miles on the river.

Accepted, with an amendment extending the thanks of the Association to the various newspaper offices for their courtesies.

The Convention then adjourned, to meet again Friday morning at 9 o'clock.

FOURTH DAY'S PROCEEDINGS.—MORNING SESSION.

The session was called to order at 9 o'clock, Dr. Arthur in the chair.

The first subject on the docket was that of the Celluloid base. Mr. Hyatt, secretary of the company which manufactured that substance, made brief remarks in reference to it, that were highly commented upon by several of the members. A paper on the manner of treating exposed nerves, with creosote, and oxychloride of zinc, was next read, and was received very favorably by the Association.

Col. H. S. Knight, passenger agent of the Chicago and Alton R. R., learning that some of the members intended making a trip to Detroit, submitted to them a proposition wherein he agreed to supply round trip tickets at $20, the regular rates being $16.50 each way. The proposition was considered a very liberal one, and was taken under advisement.

"Dental Education" was the next subject introduced for discussion. Dr. Cobb spoke of the great importance of the subject and said that the progress of the profession to the elevation desired could never be attained without more attention being given to it in an educational point of view.

Dr. Arthur considered it a subject well worthy of the most serious attention. He thought that after this time it would be too late to attend to the question, and said that it was a duty we owe to ourselves as well as to the public to see that those who enter the profession are better educated than, as a general thing, they are.

If there are no institutions where a good education of this kind can be obtained, then it becomes the duty of the profession to see that such are established. Dr. Arthur spoke at length on the subject, saying that the dental profession was as capable of furnishing able professors as can be found anywhere in the world. The doctor desired to establish a dental institution, provided he could find men of the profession who would co-operate with him.

Dr. Morgan, of Nashville, was of the opinion that the dental colleges of to-day were far superior to those of twenty years ago. He saw no way of establishing a college of the kind unless it was very heavily endowed, so that the professors could receive pay enough to allow them to devote their entire time to instruction.

Drs. Knapp and Walker, of New Orleans, gave their views of the subject, expressing themselves in very forcible terms against the practice of issuing diplomas as fast as possible, with no regard to the amount of education imparted, and with sole regard to financial considerations.

The balloting for officers of the Association for the ensuing year was then in order. Dr. J. R. Walker, of New Orleans, was elected President; Dr. Isaiah Forbes, first Vice President; Dr. Redman, of Nashville, second Vice President; Dr. Freeman, of Nashville, third Vice President; Dr. Judd, of St. Louis, Corresponding Secretary; Dr. J. F. Thompson, of Fredericksburg, Va., Recording Secretary, and Dr. J. Hall Moore, of Richmond, Treasurer.

The following executive committee was appointed: Drs. Arrington, Morgan, Knapp, McKellops and Henkel.

Dr. Walker moved that the time of the next meeting be changed from Mardi Gras day to the last Tuesday in April. Lost.

Dr. Park presented the following resolutions:

Resolved, That a vote of thanks be extended to the press of St. Louis for the kind and efficient manner in which they have reported the proceedings of this Association.

Resolved, That a vote of thanks be given to the officers of the Association for the able manner in which they have administered the affairs of their respective offices. Unanimously adopted.

Dr. Arthur, on retiring from office, stated that he was greatly indebted to the Association for the interest shown during the proceedings, and that he always endeavored to perform the duties of his office to the best of his ability.

Dr. Thompson moved that Dr. King should escort the newly elected officers to their seats. Adopted.

Dr. King seated Dr. Walker, who again extended his thanks, and the thanks of the section of the country he represented, for the kindness shown him.

Dr. Forbes, first Vice President, when called upon for a speech, remarked, "Brevity is the soul of wit," and took his seat. Dr. Redman could only repeat the same remark made by Dr. Forbes. Dr. Walker spoke of Dr. Forbes' remark, and hoped it would be a lesson to the members and they would profit by it. Dr. Arrington was glad Dr. Walker had come to that conclusion. Drs. McReynolds and Henkel were appointed delegates to the American Dental Association. Dr. McKillops invited the members of the profession present to attend the session of the Mississippi Dental Association to be held at Cincinnati next month.

The Convention then adjourned to meet at Memphis, Tenn., on Mardi Gras day.

ARTICLE II.

Record of Tests of Saliva.

BY GEO. H. CUSHING, CHICAGO.

Read Before the Illinois State Dental Society.

I desire to present to the attention of the society, a record of certain examinations I have recently made, of the fluids of the oral cavity. I wish to preface this record by saying that I do not claim that these experiments are conclusive, or exhaustive, but on the contrary, that they are only the beginning of a series of experiments, which I hope may be sufficiently extended by others, as well as myself, to enable us bye and bye to announce some definite and reasonable conclusion therefrom.

The tests with the most striking results were made in the mouth of a young lady of about 24 or 25 years of age, sanguine-bilious temperament, dark hair and eyes, and of very fair clear skin. She enjoys excellent health, and is especially free from anything like dyspepsia. Her mouth is a particularly healthy one, with beautifully colored and healthy gums. Her teeth are beautifully shaped, small, and of pearly white color. She has lost five, four molars and one bicuspid, and at the time I commenced my observations, only three had been filled, two of which had lost the vitality of the pulps.

It could hardly be said that decay was at all actively progressing, as I only found four slight cavities that required filling, and there was every evidence that these had been a long time in reaching their present condition.

With the exception of those that had been filled, and those that I treated (all of the latter superior molars and bicuspids,) the teeth were as perfect as any I have ever examined—free, even from the suggestion of imperfection or decay.

The importance and value of these experiments, I think will be clearly apparent, when it is considered that this is only the unit in the series which it is hoped may some day be fully completed.

The tests were made with litmus paper, prepared by Squibb. The tests were applied to all parts of the mouth, the special points of observation having been, at the ducts of Steno; under the tongue; upon the forward part of the tongue and its base; and between the teeth. The latter point of observation will not be particularly referred to in the record, as it was almost uniformly neutral in its effect upon the litmus.

Dec. 27.—3 P. M. Fasting since morning, very marked acid reaction in every part of the mouth.

Dec. 29.—1 P. M. Just after eating of pickles—barely a trace of acid, hardly enough to detect, and that only between the lower teeth.

Dec. 30.—Just before lunch, less acid than on 27th—everywhere apparent—somewhat more so at the ducts of Steno than elsewhere. Just after lunch, much less reaction than before eating, but found everywhere as before. 3:30, same as last.

Dec. 31.—10 A. M., and also just before lunch, about same as on 20th at same hours. Thirty minutes after lunch a marked difference—only just apparent, except above the ducts of Steno, and very much less there than before eating.

Jan. 2.—10 A. M. Reaction same as before as to locality, but slightly less in degree than upon former examination at the same hour. Just before lunch, somewhat more acid. Just after lunch (with a pickle,) considerably less acid and a half hour after, having meanwhile eaten honey—still less reaction.

Jan. 3.—10 A. M. Greater in degree than yesterday—same as to locality, except that under tongue, two trials gave no reaction and six or eight gave very marked reaction. Just before lunch, same as at 10 A. M.,—under tongue—first test gave no reaction, six others all marked acid—after lunch, very little less reaction than before—had pickle and honey for lunch. 4 P. M. Same as last.

Jan. 5.—10 A. M. About same as on 3d. 10:20—having just eaten a few peppermint drops, reaction only

just perceptible, except at base of tongue and on the soft palate where reaction was strong, as before eating the peppermints. 3 P. M.—Having eaten no lunch, but more or less peppermint drops during the day, reaction same as at 10 A. M., except that under the tongue it was scarcely perceptible.

Jan. 6.—10 A. M. Quite acid everywhere. Just before lunch, very slight generally, and much less on posterior of tongue than ever before observed. After lunch of cranberry pie and honey, very slight reaction generally, except at Steno's ducts, where it was moderate; under the tongue very slight and at back of the tongue very great.

Jan. 8.—10 A. M. Sick the day before with headache and ate nothing all day. Much less reaction generally than usual, especially noticeable at back of tongue. 1 P. M. Still less reaction than at 10 A. M., and back of tongue scarcely a trace.

Jan. 9.—10 A. M. Less than usual; 12 M. and 3 P. M. about the same.

Jan. 10.—10 A. M. Reaction uniform as to locality, but very slight. 1 P. M. Slightly increased; 3 P. M., somewhat more than at 1 P. M., except at base of tongue, scarcely a trace.

Jan. 12.—9:30 A. M. Greater reaction than on the 10th; lunch less than at 9:30.

Jan. 13.—10 A. M. At Steno's ducts acid reaction as great as ever observed. Under the tongue less than before, comparatively; at base of tongue barely a trace. After lunch (with pickle) very slight reaction indeed at Steno's ducts; less under tongue; none anywhere else.

Jan. 14.—3 P. M. Has not eaten since morning: been suffering all day with severe headache. Not a trace discernible at left parotid, and only the very slightest at right parotid; absolutely neutral elsewhere.

Jan. 15.—10 A. M. Moderate reaction generally. 3 P. M. Scarcely perceptible.

Jan. 17.—11:30 A. M. Alternately acid and neutral

in some places all over the mouth. This peculiarity most marked under the tongue, where a dozen or more tests, following immediately one after the other, gave alternately very acid reaction, and absolutely neutral.

Jan. 21.—1 P. M. No lunch. Slightly acid at Steno's ducts and a little under tongue. 3 P. M. Slightly less than at 1 P. M., but more so at base of tongue.

Jan. 22.—11 A. M. Slight reaction generally, but very marked at base of tongue. 4 P. M. Quite uniform throughout the mouth, and about same degree as in morning.

Jan 23.—10 A. M. Slight reaction generally, and a little variable under tongue.

Jan. 24.—10 A. M. Moderately acid, but very uniform throughout the mouth. 3 P. M. Just after eating freely of pickles absolutely no acid reaction anywhere, except at base of tongue.. Just a perceptible alkaline reaction at the left parotid and under tongue.

Jan. 26.—10 A. M. Moderately acid everywhere. After lunch (with pickles) not a trace to be seen, except slight at left parotid.

Jan. 27.—10 A. M. Same as last, at same hour; no lunch or pickles. 3 P. M. Scarcely a trace of acid.

Jan. 29.—3 P. M. No lunch. More reaction at Steno's ducts than in the last two experiments. None under tongue nor at its base.

Jan. 31.—12 M. No lunch. Uniformly slight reaction everywhere. 2 P. M. Having eaten candy and nothing else, just the same as at 12 M.

Feb. 2.—10 A. M. Hardly a trace to be discovered. After lunch (with pickles) a slight reaction at parotids and no where else.

Feb. 10.—2 P. M. Having eaten considerable candy, very slight reaction anywhere, hardly perceptible.

We have here a record of observations made on twenty-five days, between December 27th and February 10th, most of them taken at three different hours of the day, and generally with two to five tests at every point examined

made at each time of experiment. The results are before you in all their variety.

The following record has less interest, as presenting very little variety of result, but is one of the series necessary to complete our study. The record is of observations in my own mouth.

Dec. 31.—Alkaline reaction in several places in mouth.

Jan. 2.—Before and after lunch neutral.

Jan. 3.—10 A. M., neutral; just before lunch just a perceptible acid reaction; half an hour after lunch quite decided acid everywhere.

Jan. 5.—10 A. M., having eaten a few peppermint drops; and reaction greater than ever before, but not very great anywhere; most marked opposite parotid and not perceptible under tongue.

Later.—Less marked acid reaction.

Jan. 6.—Before lunch, very slight, and opposite left parotid; not perceptible elsewhere.

Jan. 7.—About same as 6th.

Jan. 8.—Just perceptible acid reaction in two or three spots, none elsewhere.

Jan. 9.—Slightly acid.

Jan. 10.—A little more than on 9th.

Jan. 12.—10 A. M., greater acid reaction than I have ever observed; after lunch about same.

Jan. 13.—Morning and after lunch, alike slightly acid.

Jan. 14.—3 P. M., having lunched not a trace; neutral.

Jan. 17.—11:30 A. M., very slight acid at left parotid; neutral elsewhere.

Jan. 21.—Scarcely a perceptible trace of acid anywhere or at any hour.

Jan. 22.—At 1 P. M. and at 4 P. M., absolutely neutral.

Jan. 24.—At 10 A. M. and 3 P. M., neutral.

Jan. 29.—More acid than I often find.

Jan. 31.—Neutral all day.

Feb. 2.—Neutral all day.

Feb. 10.—Neutral all day.

In submitting the above record, I have no comments to make at present, nor theories to advance. I only desire to draw the earnest attention of the profession to this subject, and to enlist as many as possible into the ranks of the observers in this direction.

The conditions and peculiarities of the secretions of the mouth are probably very imperfectly understood, and the importance of arriving, if possible, at a definite conclusion regarding them, is too evident to need any enforcement of argument.

If we would arrive at satisfactory conclusions, we can only do so by conducting, systematically, experiments of the nature of those here recorded. Of course these observations only tend to the elucidation of certain points, not of all by any means, which it is necessary for us to determine, but, when these are settled, then we can pursue our investigations in other channels.

I wish to say a few words as to the methods of making these tests.

Too great care cannot be exercised in such experiments, and for them to be of any value they must be conducted upon some general plan, so that the observations of one man may be compared with those of all others, upon the same basis.

First—It is very important that the same quality of litmus should be used—and probably there is none prepared more reliable as to its uniformity and delicacy than Squibb's. I would suggest that all who are disposed to assist in these investigations use Squibb's litmus exclusively.

Second.—The experimenter should be provided with the red as well as the blue test paper, and should test for alkalinity, as well as for acidity.

Third.—In making the tests, great care should be observed to have everything clean which comes in contact with the litmus, and especially it should never be used with the naked fingers, as the moisture from the hand will generally occasion an acid reaction.

The litmus, cut into small pieces, should be applied with a pair of pliers which have been previously thoroughly cleaned, then your observations will be of some real value.

Unless these precautions are observed, and uniformity of method be practiced, it is evident that such investigations can not be successful.

ARTICLE III.

Improved Method of Packing Moulds.

BY GEO. S. FOUKE, WESTMINSTER, MD.

The prominence of the alveolar ridge and the impinging of the teeth and gums upon the cast, very often complicate the packing of the mould to a degree that interferes materially with the success and integrity of the work. This difficulty is entirely overcome, and the closing of the flask made easy and sure by packing or introducing the material of which the plate is formed directly against the male cast, and by retaining the teeth and the cast in their true relative position to each other.

The Process.—Place the case in the bottom of the flask in the usual way, and cover up the rim with plaster to the top of the gums, trimming as usual. Oil the plaster around the outside of teeth and across the back of the flask, place the ring on the bottom of the flask and proceed to fill with plaster in the following manner:

Pour the plaster carefully around the teeth until the space between the teeth and ring is filled up, and finish this part of the mould by covering up the tops of the teeth out flush with the lingual surfaces, and by building up the plaster from the edge of the base plate in the rear up all round to the edge of the flask. Trim the plaster from the edge of the base-plate and border of the lingual surfaces of the teeth with a sufficient bevel and roundness to allow of an easy separation of the top part, (to be moulded after-

wards,) from the ring part of the mould. Having filled the ring part of the mould as directed above, and trimmed the plaster properly, oil the entire surfaces of the base-plate and plaster, fill up the mould with plaster, and adjust the top plate of the flask to its place.

Separating the top-piece and bottom from the ring of the flask, and removing the base-plate, proceed to make very small neatly cut gates; as the quantity of material required to fill the mould is so accurately and definitely ascertained that scarcely any vent is necessary for any excess of the rubber used. For cutting the gates a sharp > curve pointed scraper is best adapted to the purpose. When ready to pack remove the bottom piece first and fill with rubber the *rim* portion of the mould, return it to its place, and with the screw clamp press it till adjusted to its place against the ring. Next remove the top piece and proceed to fill all the spaces between the cast and the teeth, till the pins of the teeth are well covered and the mould is packed out flush with the lingual sides of the teeth. A piece of rubber large enough to cover the face of the cast, and a few extra pieces of rubber used where it is indicated to be required, and the top-piece of the flask is pressed down against the rubber, using for the purpose a large screw clamp. The top had best be removed now, and any deficiency of rubber noticed can be supplied, when the final closing of the flask is made, the screws applied and the operation completed.

The dentist will readily perceive the great practical advantages of this process of packing the mould, in the exact and certain progress of the work, and in the avoidance of injury to the teeth or any derangement of their articulation.

It may be added that in cases where the teeth rest hard on the ridge, (especially in partial cases,) and no rim exists, the ring and bottom of the flask may be confined together by setting the case in plaster in the bottom of the flask, placing on the ring and covering the teeth at once. In this way there will be but one point of separation, namely, the top-piece from the other part of the mould.

It is believed the extreme simplicity of this method of packing the mould, and the entire accuracy resulting from it, will enable the dentist to continue the use of the flasks and vulcanizers as now constructed, and avoid the expense and trouble of the complicated devices recommended for this purpose.

SELECTED ARTICLES.

ARTICLE IV.

Conservative Treatment of the Dental Pulp.

BY H. L. SAGE, D. D. S.

This is a question which partakes of a personal nature, so far as it can be answered by a recital of personal experience in practice.

It is a fact which has come to be quite generally acknowledged, that exposed pulps can be saved in the majority of cases, and that if they *can* be, they *should* be. If they can be saved by proper treatment, it is a neglect of duty, and an act deserving of some censure to destroy a pulp, unless the conditions are such as to render an attempt to preserve vitality very much of the nature of a forlorn hope.

Granting that control of the patient can be had, even if the attempt is likely to prove a failure, the indications will usually be manifested in time to abort any serious consequences which might ensue, while, if the trial is made with due care and proper preliminary treatment when the condi-

tions are such as to require it, it is not too much to affirm that, at least, nine-tenths of the exposed pulps which come into our hands can be protected and saved.

The day of tedious, protracted root filling, let us hope, is past, as related to teeth which have not already lost vitality or in which inflammation has not so involved the pulp as to have reached a highly congested stage. " A living dog is better than a dead lion," so a half living tooth is better than a dead one, if its presence creates no disturbance. A dead tooth has entered on a deteriorating process which will eventually cause its loss. When the pulp of a tooth dies, though the latter may for a time keep up a sort of semi vitality through its pericentum, it is liable, sooner or later, to become entirely devoid of life, when every source of nourishment having been cut off, it will either be cast aside because its presence is no longer tolerable, or hold a mere mechanical relation to the parts around it. The animal constituents, having become dead, effete and shrunken matter in the tubuli, the latter will be filled with the debris, and whatever fluids may find their way therein, either through the peripheral portion or through the tubules opening from the walls of the pulp cavity, will stagnate, and, together with the dead animal matter cause discoloration, while the integrity of its structure as related to strength will have become greatly impaired.

It may be likened to a tree which, having ceased to derive nourishment from the soil, or having been deprived from any cause of the elements of nutrition, loses the toughness of fibre which it once possessed, becomes spalt, decays, disintegrates and finally returns to the dust from which it was taken. If a tooth in which the animal matter is dead, be immersed for a few days in violet ink, for instance, the latter will pass into the tooth at the junction of the dentine and enamel, or the minute longitudinal cracks or checks in the crown, and entirely through to the centre.

What then is to prevent a dead tooth from becoming discolored more or less, according to age, density, the size of the tubules, etc.?

But this is a diversion from the subject. It shows, however, the futility of trying to make a moisture tight filling, by way of experiment, if you please, in a dead and dried extracted tooth, when fluids will penetrate the tooth from the side opposite the filled cavity, and passing entirely through it, reach and discolor the surface of the gold.

To conduct the experiment properly, the tooth should be living and fresh from the mouth, or recently living, and one in which the animal matter has not become dry. But more upon this point at a future time.

But, as bearing upon the question before us, it becomes of some importance when we enquire, what is the experience of individual practitioners with a method of treatment which has become so general, namely, the preservation of vitality in pulps which have become exposed by the encroachment of caries or by accident.

These pulps may be classified under two heads; those recently exposed and those exposed for an indefinite length of time; the latter presenting in various inflammatory conditions.

As to the sloughing or pus secreting pulps, few probably, are in the habit of treating these with a view of saving and restoring to health the feeble remnant of pulp tissue. Such a condition requires a fine degree of perceptive and manipulative talent, to diagnose and properly treat it. When pulps reach this stage, comparatively little is to be gained by conservative treatment, or only in exceptionable cases, and personally, my attention has been but little directed thereto, perhaps from some lack of faith in its practicability or importance.

In making a statement of the results of capping by the use of the oxychloride of zinc, time will not permit of entering much into details as to conditions.

Two methods were adopted, namely: capping and filling with the same material to remain a longer or shorter time. before removing a portion and protecting by a permanent filling, or, at the same sitting, capping, removing the ex-

cess and filling over with gold or amalgam, the character of the permanent filling as to material not always corresponding to the judgment of the operator, but to the pocket, economical notions, or ideas in general of the patient, as he might elect: the controlling power not always being within the influence of the dentist.

It is natural to suppose that success might not follow the first attempts to save exposed dental pulps, in so large a ratio, as after more experience had been gained by frequent cases requiring treatment.

At first, all capped pulps were allowed to run a time for trial, while now, when practicable and best, the work of capping and filling permanently is completed at same sitting, the results having seemed to show that, if the pulp is healthy, the latter is the best course that can be adopted, owing, probably, to the fact, that the fluids of the mouth will permeate an unprotected oxychloride filling, to a certain depth at least, and may thus, especially if they are unhealthy, prove irritable to the pulp.

Again, patients are not always, or indeed in most cases, watchful or prompt to return at the time appointed, but not unfrequently neglect to report until the oxychloride filling is worn away or softened at the base, and the pulp becomes again exposed or injured by contact with the fluids from without, while many times, the tooth being placed in a comfortable condition, they neglect to return at all, and it is lost by inattention.

While in some locations and in healthy mouths, oxychloride fillings will remain without deterioration for years even, in others, they will rapidly soften and wear away.

Cavities in the proximal surfaces of bicuspids and molars, if filled with this material, are, in many cases, soon left without protection, more particularly if the gums are unhealthy, and the cavity extends below the margin of the gums.

What the agent is that acts upon the filling is not certainly known, but that it is an alkali is, perhaps, more probable than that an acid produces the effect.

That ammonia is the agent is very likely. If ammonia is present in the mouth in excess, it will soften and decompose an oxychloride filling.

If a hardened mass of this material be placed for a few days in a solution of twenty drops of aqua ammonia to the ounce of water, it will become soft and chalky. If immersed in an aqueous solution of hydrochloric acid, say six drops to the ounce of water, no effect will be produced, but a strong solution of the same will dissolve the oxychloride.

Acetic acid, twenty drops to the ounce of water, has no effect, but if the acid is in the proportion of fifty drops to the ounce of water it will decompose the oxychloride. Weak aqueous solutions of chloride of sodium, caustic potassa or caustic soda are also inert if the oxychloride is placed therein. Strong aqueous solutions of caustic potassa or soda will act upon it.

Guillois' cement or oxychloride of zinc, if hardened out of the mouth, just moistened, and touched with litmus paper will present a strong acid reaction, no matter, comparatively speaking, how many times the experiment is repeated. A Guillois' cement filling which had deteriorated greatly, after a trial of a few months in a mouth in which the fluids were excessively alkaline, was washed to cleanse the surface and subjected to the same test, when it gave only very faint acid traces.

This filling was undergoing decomposition, and others which had been inserted in labial surface cavities in adjoining teeth had, from this cause, loosened and fallen out, though the fillings were at first protected thoroughly from moisture for twenty-four hours. But the gums above the cavities were unhealthy.

Litmus paper, previously reddened by an acid was held near and over them, when vapor was immediately evolved, showing the presence of a volatile alkali. Probably this was ammonia generated by the inflamed gums, though it might have been present in the breath as well, for ammonia is, according to Richardson, Viale and Latini, present in the

healthy breath; taking all sources together, there may be an excess in the fluids of the mouth, in individual cases. That this was the agent that decomposed the fillings is more than likely. Ammonia is generated by decaying animal and vegetable matter. Unhealthy gums, being akin to putrefying substances, will doubtless throw off ammonia, as well as the animal and vegetable matters taken as food, if particles are allowed to remain between the teeth until decomposition sets in.

Thus we often find that oxychloride fillings, if placed in cavities extending below or above the margins of the gums, more particularly in the bicuspids and molars, are very likely to become soft and disintegrate. Here too, the gums often become unhealthy by overlapping the sharp borders of cavities, and the foreign matters which lodge therein putrefy and become poisonous and irritable to the tissues about them.

The results will then be as stated, if the gums are inflamed and the person is not particular to remove foreign matters from between the teeth, notwithstanding the filling is thoroughly protected from moisture for a day or two, as it may be by the use of the rubber dam, during the insertion of the filling, and flowing wax over it by means of a hot instrument; beside, the food is more liable to become wedged and retained between the bicuspids and molars than elsewhere, for the reason that mastication is mostly performed with these teeth and their larger proximal surfaces are more favorable for retaining it.

More might be said upon this point, and though a little off from the subject, the diversion has been natural. Now, as to capping pulps.

Since Dec. 16th, 1868, and up to the present time, I have capped two hundred and forty pulps, of which number, two hundred and four were capped previous to Jan. 1st, 1874, with the oxychloride of zinc, which is my present practice. Creosote was first applied in the majority of cases, but on May 10th, 1872 carvacrol was substituted, and has been em-

ployed since that time, to the exclusion of creosote from practice, with results fully as gratifying, and in some respects more so than when the latter was made use of. Where one employs the oxide, saturated with creosote, as a paste dressing and capping before flowing over the oxychloride, he will find it an improvement if he substitutes carvacrol for creosote; it being less irritating and more soothing to wounded or inflamed surfaces of pulp tissue.

Though carvacrol is but slightly caustic or escharotic, it penetrates tissue much more readily than creosote; and that it has more positive, certain, instantaneous and lasting effect in abating odontalgic pains than any agent in use by dentists, is a fact which practical tests have rendered clear to my mind.

The following is a synopsis of the cases treated during the time referred to, that is up to Jan. 1st, 1874:

Number pulps capped,		204
Of these there were		
Exposed,	119	
Exposed and bleeding,	57	
Exposed nearly, or doubtful,	28	
		204
Temporarily filled,	76	
Permanently filled, that is,		
At the same sitting,	94	
At a subsequent sitting,	34	
		204
Of these capped pulps that produced no subsequent trouble, there were,		
Tested and found to be living,	77	
Not tested,	112	
Number that produced abscess,	4	
Would not tolerate a capping,	11	
		204
Deciduous pulps capped,	12	
Number that produced no trouble subsequently,	12	

Concerning the pulps that were capped and produced no subsequent discomfort, allowance must be made for the fact that the greater number of the patients did not return to report, though many were frequently met on the street or elsewhere, while in the case of others who did return for dental operations, the fact that certain pulps had been thus treated escaped the memory of the operator, and the circumstance would not be called to mind, without referring to the record. Hence, it is fair to infer that had trouble occurred the fact would have been stated by the patient.

Beside, most of these were healthy pulps. None of the pulps that were touched with carvacrol before capping have indicated disease or produced discomfort, excepting the temporary pain which usually, though not always, follow the application of the oxychloride.

Concerning the results of recent treatment, sufficient time has not elapsed to report positive success, though pulps which will not tolerate cappings are apt to indicate it very soon in most cases. Doubtless some pulps die after capping quietly and painlessly.

Some, though living, are lame, and must be regarded as invalids to some extent—sickly, uncomplaining members of the family not quite so healthy as a pulp which has not been exposed but answering a tolerable purpose nevertheless; while with many or most healthy pulps which have been treated in this way, the situation is yet more favorable or entirely satisfactory. Hereafter, more preliminary treatment should be carefully given to exposed pulps of long standing and in various stages of inflammation, so as to be assured of their restoration to more healthy conditions, before applying the oxychloride; though it is likely that, on removing the cause of irritation and protecting by capping, the inflammation will often subside and the pulps take on healthy action without further treatment, as Case 146 may serve as an illustration.

Mr. F. M., a young man of nervo-bilious temperament presented Feb. 20th, 1873, with a cavity in the anterior

proximal surface of the right inferior second bicuspid. The pulp was exposed, aching furiously, bleeding profusely and protruding from the orifice of exposure. Nothing would quiet it but carvacrol, and that not easily.

It was capped and the cavity filled with the oxychloride, the patient being instructed to return in three weeks, if no previous trouble occurred. No pain on application of the capping or during the absence of the patient, who presented Feb. 18th, 1874, (one year thereafter, lacking two days,) for a permanent filling. The capping was very hard indeed, the pulp alive and the tooth presented every appearance of perfect health, as the sensitive margins of the cavity showed. The excess of oxychloride was removed and the layer remaining protected by a gold filling, since which time the tooth has sustained its reputation for good behavior. It would be entirely out of place to cite other examples here, of individual cases, and unnnecessary, as most or all of you concur with the view, that conservative treatment of exposed dental pulps is no longer an experiment which the results do not warrant us in continuing, but a life and health, as well as a pain and labor saving operation.—*Dental Register*.

EDITORIAL. ETC.

The St. Louis Meeting.—We regret to learn that the late meeting of the Southern Dental Association was very slimly attended, but few dentists outside of St. Louis being present, especially practitioners from the Southern States. This was quite a disappointment to the friends of the Association, for it was expected that many of our professional brethren from the West, Southwest and upper Mississippi would have been present, and

rendered it one of the most interesting meetings ever held. Was it too far from home? It appears to have been quite a mistake to go so far west, and we think an equally grave mistake has been committed in selecting Memphis for the next meeting, as the place should have been farther from the scene of the recent one, after which it would have been proper to have selected Memphis at a suitable season of the year. Louisville, Nashville, or some city in the mountainous parts of North Carolina or Georgia would certainly have been more appropriate. As it is we can only hope that our fears of a meeting like that of St. Louis, so far as attendance is concerned, may prove groundless, and the Memphis meeting be a successful one. We were pleased to see the names of our friends Drs. Redman, Morgan, Arrington and Walker, among those present at St. Louis, and had it been in our power to have been with them, we no doubt would have enjoyed the reunion, as we have not forgotten the pleasant time we passed together at Atlanta, Georgia, when this Association was organized. According to a statement made by Dr. Redman, when the question of changing the name of the Association was under discussion, it appears that some object to the term "Southern." This is altogether an erroneous idea, for the Association, although it was formed more especially for Southern practitioners, has been quite liberal in its action, as the proceedings of each year will demonstrate. Northern practitioners have not only been invited to attend its meetings, but also to become members and thus participate in its work—many having done so, and been appointed members of the standing committees. Therefore this Association has not shown an illiberal spirit, or a desire to confine its work to practitioners of one section of the country, but has opened wide its doors to all respectable dentists no matter from where they came. The Association, it is true, originated in the Southern States, and was so named on account of the desire manifested to interest the practitioners of these States, few of whom ever attend any such organizations.

We sincerely hope that the members of the profession in the South will become interested in the welfare of this Association, and strive to make it what it should be.

Useful Hints.—The following is from one who, although too modest to allow his name to be attached, is nevertheless well

qualified to judge of the usefulness of anything that pertains to our art:

"I am indebted to my friend Dr. James F. Thompson, the untiring secretary of the Southern Dental Association, for a method of cleaning old files, which will, I am sure, please all who try it. The process is simply to immerse the files for twenty-four hours in a solution of concentrated lye; on removing them, a brush will render them as clean and bright as if new. Of course both the files and the hands must be thoroughly washed to free them from the caustic preparation.

To the same gentleman I am indebted for the suggestion that the ordinary bread soda constitutes one of the very best articles for cleansing the hands that can be used. A trial will convince any one of its merits." H.

Large Fees.—We take the following from a daily paper in which it appears under the head of "A Costly Dentist's Bill:"

Agnes Ethel, the actress, had cavities in four teeth filled by Dr. Atkinson, a NewYork dentist. When his bill was presented she was astonished to find that he rated his services at $1.025. She refused to pay the amount, and he brought suit against her in the New York Supreme Court. Her counsel, General Wm. H. Anthon, on applying for a bill of particulars, was furnished a bill of six items, all worded alike, except that the specific charges ranged from $50 to $300: "To services of three operators in dressing your teeth, with the gold filling necessary therefor." Judge Donohue, Tuesday, ordered that such a description of the services should be given as to enable other dentists to estimate therefrom the value of the work.

OBITUARY.

Dr. T. B. Hitchcock.—The announcement of the death of Prof. T. B. Hitchcock, late Dean of the Harvard Dental School, will cause regret to all who have the interests of our profession at heart, on account of the loss of one who had shown himself to be an untiring, zealous and accomplished member of the dental

profession. Prof. Hitchcock was a graduate of Harvard Medical School, of the class of 1860, and adopted dentistry as his specialty until the commencement of the war, through which he served as surgeon in one of the Massachusetts regiments, resuming the practice of dentistry on his return home. In 1868 he was appointed to the chair of Pathology and Therapeutics in the Harvard Dental School, and became Dean after the resignation of Dr Keep. The following resolutions were adopted by the Faculty of the Harvard School, President Elliott presiding:

Resolved, That the faculty of the Dental School of Harvard University have been deeply grieved at the death of their Dean, Dr. Thomas Barnes Hitchcock, and in recognition of his character and services deem it their duty to place on record their regret for his loss and their sense of his merit.

Resolved, That in him the Harvard Dental School has lost a valuable officer, whose unwearied and successful discharge of the duties of his professorship and unselfish interest in his work as Dean, entitle him to the respect and gratitude of all who are interested in the cause of dental education.

Resolved, That the Dean be directed to communicate a copy of these resolutions to the family of the deceased, with assurances of our sincere sympathy in their bereavement.

BIBLIOGRAPHICAL.

The Physiology of Man. D. Appleton & Co., 549 and 551 Broadway, New York, Publishers.

The fifth and last volume of Dr. Flint's great and exhaustive work on Physiology, completes the labors of eleven years devoted to the subject, and places before the profession the fullest and latest views of the most eminent physiologists of the day on the important branches included in the title—the Special Senses, and Generation. The distinguishing feature of this work is that nothing is taken for granted. The author has thoroughly sifted and weighed the opinions of his contemporaries, and has held fast only those things which he has found to bear the test of actual experiment and personal observation.

The first chapter treats of the sense of touch, muscular sense and sensibility, the tactile corpuscles, and the venereal sense.

The second chapter takes up the olfactory nerves, their anatomy and physiology, and their relations to the sense of smelling and tasting.

Chapters III., IV., V., and VI., are devoted to the optic nerves, the anatomy of the eye, refraction, vision, the functions and mechanism of the iris, the muscles of the eyeball and eyelids, the lachrymal apparatus, etc.

Chapters VII., VIII., and IX., deal with the auditory nerves, and the sense of hearing in all its relations, including the physics of sound, the appreciation of harmony, discord, etc. This necessarily requires a full consideration of the anatomy and physiology of the various parts of the auditory apparatus.

Chapter X. is devoted to gustation and the nerves of taste, the tongue, and its functions, facial paralysis, etc.

In Chapter XI. the author opens the subject of generation with a general view of the female sexual organs, the ovaries, Fallopian tubes, uterus, and the erectile tissue concerned.

Chapter XII. treats of the ovum and ovulation, puberty and menstruation, changes in the pregnant uterus, the corpus luteum, etc.

Chapter XIII. gives a full account of the male organs of generation, the testicles and their secretion, the glands of the urethra, and the changes in these organs from infancy to old age.

Chapter XIV. is on fecundation, the part of the male and female in the reproductive process, the entrance and destination of spermatozoids, the influence of the maternal mind on offspring, etc.

Chapter XV. treats of the segmentation of the vitellus and formation of the membranes and placenta; Chapter XVI. of the development of the embryon, and the osseous, muscular, cu, taneous; and nervous systems; Chapter XVII. of the development of the alimentary system, the respiratory system and the face; Chapter XVIII. of the development of the genito-urinary organs in both sexes, and of the circulatory system.

The work closes (Chapter XIX.) with an admirable view of the subject of fœtal life, a consideration of development after birth, maturity, the decay of age, death, and the resolution of the body into its original elements.

It is not too much to say of Dr. Flint's complete work that it stands alone as a comprehensive treatise on human physiology, and that its publication marks an epoch in medical literature.

MONTHLY SUMMARY.

Experiments upon the Human Brain.—The experiments were made upon a girl who had lost a portion of the cranium over a small space near the vertez, in consequence of an epithelioma of the scalp. For about two inches the dura mater was exposed and the pulsation of the brain visible. It was desired to ascertain the effect of irritation of the dura mater and cerebral substance through local faradization, galvanism, etc. Five needles guarded to near their points, used as electrodes, were thrust into the dura mater and brain-substance of either hemisphere. When the needles were passed into the dura mater no evidence of sensibility appeared. Faradization of the dura mater of one side caused muscular contractions of the opposite side, especially of the extensors of the extremities. The faradic reaction of the posterior lobes was tested by thrusting one needle into the brain while the other was placed in its vicinity in contact with the dura mater. A weak electric current caused painful tingling in the opposite extremities, dilatation of the pupils and muscular contractions of the opposite side. The strength of the current being increased, convulsive action upou the opposite side ensued, followed by frothing at the mouth, stertorous breathing and coma. The attack lasted twenty minutes.

The galvanic reaction of the posterior lobes was to have been tested, but rapid extension of the disease to the left hemisphere, with grave cerebral symptoms, precluded continuance of the experiments. The case soon resulted fatally. At the *post-mortem* no especial injury to the brain matter appeared to have been directly due to the needle-punctures. Their course was marked by lines of diffluent cerebral matter, but the surrounding tissue did not seem to have been affected by the lesion.—*Prof. Bartholou in American Journal of Medical Science.*

Preservation from Hydrophobia.—At the meeting of the French Academy of Sciences, on April 13th, M. Couley laid before it a memoir by M. Bourrell, a veterinary surgeon of Paris, entitled "A Complete Treatise on Rabies in the Dog and Cat, with a Method of Preserving one's self Against It." The means of pre-

serving from rabies recommended by the author, consists in taking off the edge of the teeth of the animal with the aid of nippers or a file.(?) M. Bourrell had the daring to perform this operation of filing down the teeth of three dogs when they were in a condition of raging madness. Six dogs kept for experiment were then turned loose among the rabid animals, who attacked and bit them furiously, but without breaking the skin in any one of them. The dogs experimented on were watched during six months, and madness did not show itself in any one of the number. M. Bourrell, convinced that the blunted tooth of the dog could not penetrate through clothing, gave his hand, covered with a glove, to one of the mad dogs. "When," he says, "the dog released it the glove was intact, and the bite had only produced a deep impression." The same experiment repeated on dogs which were not rabid proved that the blunted tooth, however, violent the effort of the muscles of the jaw, would not penetrate the skin of animals, and affected the human epidermis in very exceptional cases only.—*Med. Record.*

Treatment of Poisoning by Chloral.—Dr. Albert Erlenmeyer discusses (*Der Praktishe Arzt*, Band xiv. 11) the best method of treating patients who, either by inadvertence or idiosyncrasy, have taken too large a dose of chloral. The symptoms of the toxic influence of this substance are—collapse, diminution of the frequency of respiration, which has been observed to be reduced to four in a minute; injection of the conjunctiva, contraction of the pupil, blueness of the lips, dropping of the lower jaw and retracted tongue, whilst the pulse is in the early stage strong and slow, but subsequently becomes freqent and feeble, and ultimately scarcely perceptible. In more protracted cases, the face becomes pale, there is a tendency to fainting and vomiting rigors, disturbance of velutary movements, weakness of the lower limbs, and cramps in the calves of the legs. Erlenmeyer recommends, first, that the chloral should be removed from the stomach by emetics or the stomach-pump, or be much diluted with water, tea, or coffee; secondly, that artificial respiration should be maintained; and thirdly, that some antidote should be given. Erlenmeyer doubts the value of strychnia as recommended by Liebreich, since, although chloral is useful as an antidote to strychnia, it by no means follows that strychnia should be an antidote to chloral; for we find that morphia is an antidote to atropia poisoning, but atropia is not an antidote in poisoning by morphia. He thinks musk might be tried, but is inclined to place most reliance on liquor ammoniæ subcutaneously injected. As a last resource, transfusion my be adopted.—*Practitioner.*

Electricity for Chilblains.—An Italian physician claims great success in the treatment of chilblains with the electro-magnetic apparatus. A current of medium intensity is passed through the diseased part for fifteen minutes, with great relief to pain. One or two sittings will cure—so it is said. The same treatment has been successfully employed in neuralgia of the testis, in which the pain was so excruciating, that the patient begged to have the gland extirpated. A case also is reported of successful treatment by the same means, of an obstinate lumbago which had resisted every other plan.—*Pacific Medical and Surgical Journal.*

Cure for the Toothache.—Dr Henry T. Reynolds, of Baltimore, writes to the editor of the *Medical News* that, for eighteen months he has been using acetate of lead as a remedy for toothache. He finds it better than any of the numerous remedies proposed in the books, and in cases in which it is applicable, the relief is instantaneous. He advises the sufferer to apply from one to three grains to the cavity for a moment or two, then spit it out. It fails in fewer cases than any remedy that Dr. Reynolds ever tried, not more than eight per cent.

Marine Glue.—The *Journal of Applied Chemistry*, gives the following, which is said to be both firm and waterproof: 1 lb. of caoutchouc, cut into small pieces by means of a wet knife, dissolved in 4 gallons of wood naptha. The solution of the gum should be aided by frequent stirring, and will usually occupy 10 or 12 days. When this is completed 2 pounds of shellac are melted in an iron ladle, and one pound of the solution stirred in, and the glue poured out to cool upon slabs.

Ether and Chloroform.—"We are able to say that in the present state of science the medical man is responsible for every case of death occasioned by the application of ether, because a careful watching of the respiration is capable of preventing death, whilst the lethal effect of chloroform depends in part on individual predisposition, which the physician is unable to recognize."—*Prof. Schiff, of Florence.*

Singular Death from Blood-poisoning.—Dr. Weigel, a surgeon connected with the military hospital at Münster, was recently made dangerously ill, the result of inoculation with morbid matter absorbed at an autopsy through a slight wound in his hand. In performing an operation for his relief, another surgeon, Dr. Kruse, chanced to make a slight incision in his finger, by which means he himself became inoculated, and, after severe suffering, died.—*Boston Med. & Surg. Jour.*

[illegible] RUBBER.

[illegible] June 23d, 1874.)

[illegible] a base for artificial dentures are [illegible] f which the material is capable: [illegible] it depends, not alone on the skill [illegible] eat extent, on the quality of the

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ARTICLE I.

Ætiology of Dental Caries.

BY A. W. HARLAN, CHICAGO.

Read before the Illinois State Dental Society.

From the earliest period in the history of dental science there has been diverse opinions as to the cause of caries of the teeth, and up to the present time the vexed question has not been settled. One asserts that decay is caused by the action of acids entirely; another maintains that acids are only the commencement of it, and afterwards a parasitic plant is wholly the cause of the subsequent changes observed; still another observes the loss of the lime salts beneath a perfect gold filling. The same writer (Dr. H. S. Chase,) instances the absorption of dentine beneath what he terms necrosed enamel from pressure caused by a contiguous tooth; the pressure causing the circulation of the blood plasma to cease in the basal substance of the enamel; the discoloration taking place as a natural consequence; and the irritation simultaneous with the necrotic process causing

the vital movement in the dentine which carried away its lime salts.

Thus we have three different theories upon the immediate or exciting causes of decay of the teeth ; the chemical, the parasitic, and the vital. Before expressing an opinion as to what agents cause the destruction of the teeth we will see what the predisposing causes are:

In examining authorities on the subject we find that "the power of teeth to resist decay is sometimes weakened by a change brought about in their physical condition through the agency of certain remote causes, such as the profuse administration of mercury, the existence of exanthematous diseases in infancy and early life, and all severe constitutional disorders." Harris and Garretson believe that there is an hereditary tendency in certain teeth to decay, even to the transmission of the shapes of the defective teeth of the parents. This might be true, if the same condition otherwise obtained in the mouths of both parent and child, but on the reversal of that condition it is obvious that decay would not be the result of hereditary transmission. Lack of exercise is supposed, by some, to be a predisposing cause of decay ; imperfect structural formation, pits, fissures, depressions and cracks in the enamel, affording a place of lodgment for food, acids, etc., are all predisposing causes. The six-year molars are often what Tomes describes as in a honey-combed condition, and are therefore peculiarly liable to decay. The changes in temperature from hot to cold do not, according to Dr. Flagg, check the enamel, thus facilitating decay, but diminished vitality is conceded to be the result of long continued alterations in temperature from hot to cold.

Mr. Oakely Coales in a little work called "Notes on Dental Pathology," says: "The experience of many accurately collected and carefully compared, will, I believe, show that it is impossible to assign any single process or action as the cause of decay in the dental organs. When we remember that the mouth is the chamber through which

passes all the nutrition of the body, solid fluid and gaseous, and that it is liable to be acted upon by all the various conditions and temperatures in which the several forms of nutrition may be taken in, there seems fair ground for coming to the conclusion that all these, severally or in combination, may produce that condition, which we know in the teeth as caries. I would not shut out, as predisposing states, mechanical pressure and irritation going on to such an extent as to cause disintegration of the tooth substance ; but I would not have them confounded with the immediate cause of decay."

"Looking at the facts that are constantly being brought under the practitioner's notice of cases where the patient tells us that up to the time of some illness or other there was no decay of the teeth, *it seems irresistible that we must look for the cause of caries within, and not without the tooth.*"

Further on he says: "Is it not reasonable to suppose that in all cases of caries an organic change of the tooth itself takes place, forming the first stage of decay? May we not go further and say that in many instances we can assign the cause as a want of balance between the organic and inorganic constituents of the tooth, and that in others it is the general impaired nutrition of a local, or, it may be, a result of character?"

"If it can be clearly shown that the actual and immediate cause of caries in the teeth is from within, then we have more certain data for going upon in the treatment of this form of disease."

I suppose that inflammation of the gums consequent upon a scrofulous condition of the general system is a predisposing cause of caries. Many other causes that are well known, such as stomatitis, dyspepsia, etc., might be enumerated, but the above are sufficient for our purpose. This brings us to the immediate or exciting cause of caries. The experiments of Westport, Allport, Mantegazza, Magitot, and others, agree in showing that vegetable and mineral acids, however,

it is said, do not all destroy the same tissues—that is, some act upon the enamel, others upon the dentine and cementum. Leber and Rottenstein state that all acids are capable of destroying any part of a tooth if you will give them time enough. In the experiments out of the mouth they think also, that decalcification of the dentine takes place simultaneously with that of the enamel, only that it is not so readily observed. I see no reason why this may not be so. As Todd and Bowman observe, that canals exist between the enamel prisma, *why may not the acid penetrate these minute canals, and the work of destruction progress within at the same time that softening of the enamel is taking place from without?* Tomes found these canals in the teeth of young animals. Czermack believes that he has seen very numerous delicate enamel tubules arrayed in close series. We all know how soon our teeth can be "set on edge" by eating a lemon. May not this account also for a phenomenon observed by Prof. Chase in his paper of last year? We find two teeth very close together, something lodges between them long enough to decompose and give off an acid which enters the canals referred to; the work of destruction has commenced within, and by the time we suspect caries, from the black or brownish appearance of the enamel, *there has been a softening of dentine beneath this dark spot of enamel,* but vital action did not cause it, *it was the penetration of the acid through the canals between the enamel prisma.* After cutting through the black or brownish spots with the "shining surfaces" do we find a portion of the calcareous salts to have disappeared? I answer, not at all, but we do find a pulverulent mass that we can blow out of the cavity by an air syringe, which in my opinion, from actual observation, is the disintegrated lime salts.

These cases are very rare; I had seen but one such before having listened to the reading of Dr. Chase's paper, and could not account for it. After my return from Rock Island last year, I requested the privilege of cutting into another tooth of like character (as above described) in the same

patient's mouth; he consented. It was exactly similar in appearance to the one first operated upon, and is described in the paper to which reference has been made. Since that time, I have observed four other cases of the same nature, save in the appearance of the color, which has varied between the black and brown. The vital theory has been pretty severely handled by Mr. Chas. Tomes in an appendix to the new edition "Tomes' Dental Surgery," to which I refer you; further on I shall have occasion to recur to it slightly.

The work of Leber & Rottenstein has been written to support the parasitic theory; the *Leptothrix Buccalis* is the parasite which, according to them, performs the work of destruction. After the enamel has become roughened by the action of an acid, the fungus finds lodgment and commences the envelopment of minute fragments of the decalcified enamel, "and contributes by their prodigious proliferation, to their destruction." Their opinion of the cause of caries of the enamel is, that "by the action of an acid the enamel becomes porous at some point, and loses its normal consistence. At the same time there is seen to appear a brown color, in consequence of the change which has taken place in its organic structure. There is formed at the surface a bed of leptothrix, which probably penetrates the dental cuticle—if it still exists—and destroys it; chinks and fissures are opened in the enamel, which has become less consistent, acid liquids and granulations of leptothrix penetrate there, while minute fragments of enamel become detached, and are promptly enveloped by the elements of the leptothrix, which, joined to the continued action of the acid, hastens the dissolution."

They attribute the brownish color of the enamel to the decomposition of the organic portions of the tooth; according to their observations the dentine is destroyed in what they term two periods. First—The preparatory work of caries. Second—The period of destruction. Of the first they observe that "the softened dentine of a brownish color

and of a feeble consistence, situated under a carious surface, presents, after removal of the masses of leptothrix which penetrate there, peculiar changes in the dental canaliculi. The changes become, in general, more and more perceptible as we proceed from the depths of the dentine to its surface. It is easy to see in cross sections of teeth *that the canaliculi become very gradually longer, till they reach a considerable size, by the accumulation in their interior of a finely granular substance.*" This substance is granular leptothrix. The walls of the canaliculi continue to dilate until "it may happen that they cease to be visible." M. Neuman, as an evidence of the power of the dentine to resist that condition known as caries, says that the thickening of the walls of the tubes is a real thickening of the canaliculi at the expense of the matrix, and that the fibres participate in the process, the canals ultimately becoming obliterated ; he believes that in one instance he saw calcification of the fibrils.

Tomes, on the same subject, says that "Some such explanation as the following may very possibly be the true one : A solvent fluid gaining access to the tubes, effects the decalcification, complete or partial, of the matrix immediately round the tube ; as the refractive index of the dentinal sheaths differs little, if at all, from that of the surrounding decalcified matrix, they are not visible on transverse section ; but, on account of the great power of resistance, they ultimately become isolated by the wasting away of the matrix around them." You see from the above the different appearances observed in the preparatory work of caries.

We pass to the second, the "period of destruction." Leber and Rottenstein say : "If we examine the disorganized substance which covers the superfices of a carious cavity, and which, moreover, presents an acid reaction, we are truly astonished at the quantity of leptothrix which are found there. The superficial layers, with the exception of some particles of food, are formed exclusively by the granular masses, and the filaments of leptothrix." They observe

farther "that minute fragments of carious dentine, of a brown color, are enveloped and united by masses of leptothrix, above all, granular leptothrix. In the layers which lie still deeper, as the volume of the dentine increases, the leptothrix diminishes in such a proportion that the dentine forms the principal part. We see, then, in the carious portions, colored brown, irregular chinks and interstices filled with leptothrix and its elements. Further: "According to our observations we cannot refuse to admit that the proliferation of the fungus plays an important part in the decomposition of the dental tissues." To sum up they believe that the action of acids upon the teeth affords a place of lodgment for the leptothrix buccallis; that the envelopment of minute fragments of decalcified enamel by this fungus soon effects an opening to the dentine, when, the acid passing before, allows the elements of the fungus to assist in the destruction of the dentine, by entering the canaliculi, thus dilating them, and forcing the passage of the acid still deeper.

We all think that decalcification of the dentine takes place before the leptothrix enters the carious cavity. I think that this is true myself, and believe further that the leptothrix plays a small part in the production of caries, if any at all, for the following reason: Very often we find carious cavities situated on the buccal surfaces of molar teeth, and in connection with them an acid buccal mucus. Now, we are told by Gubler and others that the leptothrix is the frame work of tartar. We are informed also that the fungi seem to thrive in a neutral or slightly acid liquid; the filiments of the fungus lodge in these cavities and immediately there is commenced a deposition of tartar. From the very moment of the commencement of the deposition of tartar, decay ceases in these cavities; this condition is not a common one, but we have all noticed it. It has been said that these deposits of tartar in buccal cavities answered the purpose of a filling very well, if they were only smoothed off. I do not see how the parasite assists in the destruction

of the teeth except in this manner, that is, by the envelopment of the disintegrated lime salts as rapidly as disintegration is effected by acids, thus helping to abstract them from the organic tissue much sooner than they would be washed out by the fluids of the mouth. That parasites assist in causing the decay of teeth, I am wholly prepared to deny, but in what manner specifically I await to be informed.

Regarding the theory that vital action assists in the production of dental caries, I believe that any thing or cause, which tends to keep the teeth from being nourished properly, would cease a weakness in the tooth structure, making it easier for the acids to act upon them. Without saying anything further of this I conclude that there is no proof of the existence of central caries.

There is no species of decay that I have met with where the organic tissue of the tooth seemed to be wanting, leaving a residue of lime salts and also a porous substance very chalky in color and consistence. Where enamel still stands around the cavity, it is of the same nature, very easy to pulverize after removing it; no strength in it at all as far as the decay has penetrated. This condition is oftenest met with in the mouths of persons with flaxen hair, light complexion, etc., and the teeth are usually of medium size, with a slight yellow tinge near the gums, gradually becoming lighter in color until the cutting edge is nearly reached, when there is seen an almost imperceptible shade of a bluish cast at the extreme points of the teeth; these teeth decay very early and with great rapidity; very often in the short space of three months large cavities are seen on the labial surfaces of the lower cuspids and bicuspids; test the mouth and we *do not* find an acid reaction, the fluids almost invariably are alkaline, occasionally we find the saliva neutral. We know that excessive alkalinity of the saliva *might* cause this condition, but *does* it? There is no stringy or ropy mucus in this class of cases. I leave the solution of this question to be brought out in the discussions. One thing more about the effects of alkalies upon the teeth. At the

meeting of the "American Dental Association," at Put-in-Bay last year, Dr. T. O. Summers said with reference to the action of acids and alkalies upon the teeth in the mouth: "I am still of the opinion that the alkalies are the most destructive agents. They act upon the pabulum, taking away the base. The presence of acids does not prove that they are the cause of decay. There is nothing so destructive to animal life as the alkalies." Again in answer to a question he said: "The alkalies enter the blood vessels, coming directly in contact with the tooth substance through the local circulation, and so destroy the pabulum of which the tooth is formed." On being asked why it did not act upon the bones and other tissues, he said: "It goes into the blood at a point immediately surrounding the teeth through the corpuscles, and destroys the pabulum." This I leave also for your consideration.

In conclusion, I believe that we must look for the causes of caries almost wholly if not altogether in the vegetable and mineral acids; we find in nearly every mouth examined, an acid reaction, and where a structural defeat exists in the enamel, or any predisposing cause of decay is present in the mouth, there we will find that disintegration has commenced. Wherever teeth are very close together, so as to afford a place of lodgment for particles of food, etc., we find an evidence of the commencement of caries. Anything that tends to produce irritation of the gums, causing an acid condition, should receive appropriate treatment.

Dr. J. M. Whitney has recorded thefact of the introduction of acid fruits among the inhabitants of the Sandwich Islands; commenting upon it, he says: "So marked was the difference in the teeth of the skeletons that I could mark the time when fruits was introduced. In those fed on fruits there was one (tooth) in fifty decayed, in the older, (skeletons) one in a hundred."

It has been agreed by some that acids did not produce sufficient varieties of color in decay, to be accounted as the agents that work the destruction. I believe that my friend

Dr. Black, who is present, can account for the different colors observed in dental caries to the complete satisfaction of those who have doubted the sole effect of corrosive agents in the production of that condition known and described as caries of the teeth; a condition at once the most direful and calamitous in its nature, and one that calls out our best efforts to arrest its ravages.

ARTICLE II.

The Changes in the Shapes of Teeth that are Necessary or Proper for the Treatment of Decay.

BY EDMUND NOYES, CHICAGO.

Read before the Illinois State Dental Society.

No one having much opportunity to observe teeth which have been operated upon, can have failed to perceive that this subject is one of great practical importance, and also that in very numerous instances it has received no attention, or else a mistake has been made in the treatment, so that in many cases of refilling the previous improper cutting greatly increases the difficulty of making successful operations.

It may be asked at the outset whether nature is not the best judge of what the shapes of teeth should be, and therefore why we venture to make any changes of shape at all.

Nature is doubtless perfect in her construction whenever she is able to work up to her perfect ideal, and from her best specimens we shall learn the principles that will guide us, and find the models toward which we must work in all the changes which we venture to make in the forms of teeth, but we find nature herself adopting so many different forms, and some of them so much more liable to decay than others, that we cannot suppose each of them to be the most perfect possible for the individual case, when we have regard merely to capability of resisting decay. In most cases, however, we are not called upon to decide whether *any*

changes of form shall be made or not, for we find them already made by the progress of decay, and these changes are often very important, even though the amount of substance removed is very little, so that the usual question for us is not whether the form of the tooth shall be changed or not, but whether we shall carefully and intelligently change its form in such way as will diminish its liability to future decay, or whether we shall incidentally or carelessly allow changes which will often increase its liability to decay beyond what it had as nature first formed it.

As already intimated, we must seek for general principles and models by a study of forms and arrangement nature has adopted in the dentures which we find least subject to decay. We shall find such teeth convex in every part, (outside the alveolus,) except the grinding surfaces, and with what may be described as bell-shaped crowns.

The greatest circumference being but a short distance removed from the grinding surface toward the gum, and this, of course, determines their points of contact.

The arched arrangement of the teeth in the jaw would lead us to expect them to be compressed toward the palate so that the lingual side would present less surface than the buccal, and we find this compression even greater than the convexity of the arch requires, so that the points of contact are nearer to the buccal than to the palatal side of the teeth.. I think this characteristic is more frequent and perhaps more marked in the upper teeth than in the lower ones.

We find (in these perfect dentures) that the surfaces in contact are convex, so that it is more proper to say *points* of contact, than *surfaces* of contact, though unfortunately that is not so often the case after filling unless some care is taken to make it so. Of course these perfect teeth separate from each other in every direction from their points of contact, very slightly toward the grinding surface, somewhat more toward the gum, and often most of all toward the palate (or tongue.)

Whenever teeth are cut in operating upon them we almost of necessity leave nearly plane surfaces, and the

obvious inference from the form the best teeth possess naturally, is that what we cut away should be cut in several different planes, and so that the surfaces of adjoining teeth shall always be divergent from each other.

I presume all will agree that molars and bicuspids decayed upon their proximal surfaces, presents greater difficulties in the way of making permanently successful operations, than do any other teeth, and certainly it is more difficult to make changes in the shapes of them that will avail to stop the progress of incipient decay, or will diminish the liability to recurrence of decay after filling, than is the case with other teeth.

When they are regular in position and reasonably well formed, if the cavities are small or only incipient I think the best results are obtained by leaving the points of contact as nearly as possible untouched (unless they require to be moved a little toward the gum,) and slightly opening several of the divergent spaces or Vs, usually the one toward the grinding surface slightly, and the one toward the palate more, so as to leave a more considerable space in that direction than any other, except that in lower teeth it is often better to make the larger opening toward the cheek instead of toward the tongue. It is sometimes possible also, and often very desirable, to enlarge the V space toward the alveolus, but it should very seldom, if ever, be done to such an extent as to shoulder the neck of the tooth.

If decay has made great progress the relative strength of the remaining portions of the teeth may have determining influence as to the position of the V spaces after the fillings are completed. (The question of restoring contour will have its influence also,) but in no case, when teeth stand close together, should fillings be finished up with parallel plane surfaces opposed to each other, whether in actual contact or not, and whether the surfaces are gold, or dentine, or enamel, and the difficulty of following this rule in certain cases, should only make us the more careful to do so.

In no case should *any* change be made in the shapes of teeth without first carefully observing their natural form,

the situation and extent of the cavities in them, their position as regards adjoining teeth, and especially their articulation, or occlusion with opposing teeth, so as to foresee whether if isolated they will remain so, or whether the forces acting upon them will twist them so as to make surfaces now divergent after a time become parallel.

Such observation will often make us deviate from the usual plan of making the largest space toward the palate above or toward the cheek below. Crowding or irregularity of the teeth in any part of the mouth will very often greatly increase the difficulty of making any changes of form that will be of practical use in promoting their preservation, without cutting them so much as seriously to injure their appearance or usefulness, and the ordinary rules will often require to be modified or reversed to suit the requirements of such cases, while the general *principle* always to leave divergent surfaces as little as possible in contact, is of almost universal application.

There are probably many cases, when nearly all the proximal surfaces have begun to decay, in which it is best to isolate all the teeth by permanent seperations, and this will often be accomplished incidentally without special reference to it, in carrying out the principles and rules already suggested.

These permanent separations should almost always be *very slight* at the points of nearest approach, too little in most cases (when there is but little decay,) to admit of proper manipulation without wedging before operating. I usually resort to slow wedging, finding it practically impossible *for me* to get space enough to work in by quick wedging; a permanent space half the thickness of Froid's file No. 0, is often enough *at the point of nearest approach*, but the proper manipulation of the surfaces requires at the time of operating a space as great as the thickness of Froid's No. 2, and it is often better that it should be considerably greater than that.

In many cases permanent isolation, whether desirable or not, is practically impossible, and in a large proportion of

cases we must do all our cutting with as distinct pre-vision as possible, of what the conditions and consequences will be if the teeth come again into actual contact. I desire *specially*, to avoid giving the impression that a great *amount* of cutting is often necessary, and to give great emphasis to the fact that it is often more important to *avoid* cutting away the tooth substance that needs to remain, than it is to cut what needs to be removed; we often find that the separating file has removed the most prominent parts of the proximal surfaces in actual contact, much greater in extent than the one nature had originally provided. .Such teeth will more surely decay the second time than they did the first, so far as decay is promoted by shape merely.

I think that all necessary changes of form may be made in most cases with only slight diminution of the grinding surfaces, and often I think, without removing quite all the enamel at any point.

The work can be done with any appropiate cutting instrument, usually with files, or chisels followed by files; it is essential that the cut surfaces should be finished with faces that will receive the action of polishing material upon every part of them, and this is often easier obtained with files, and strips of corundum tape or their equivalent, than it is with chisels alone.

The "hard-bits" made by S. S. White, are very useful for the first cutting, but there are many places for which they are too thick, and a straight chisel no thicker than a separating file must be used.

When separating files are used the saw edge should be bevelled or removed on the grindstone so as to avoid all danger of scratching the adjoining tooth, for cutting in divergent planes make it impossible to cut but one tooth at a time. The cutting of each tooth should be in two and sometimes three different planes, all divering from what is intended to be the point of contact; and these points of contact in adjoining teeth should of course be made so as to oppose each other; in other words, we must take care to leave

most prominent points which we desire to come in contact.

After the file, in finishing the fillings or cut surfaces, or both must come the corundum tape or its equivalent, pumice stone on tape or stick (tape if possible,) oxide of tin in the same way, or anything that will perfectly obliterate the file marks, and put upon the best possible polish. A good polish is absolutely indispensible to every proximal surface operated upon.

The incisor and cuspid teeth present far less difficulties than the bicuspid and molars. They are much easier to isolate permanently, and are easier preserved without perfect isolation. If regular and well formed they can almost always be cut away enough toward the palate surface without changing their appearance in front, but even these, in some cases of crowding and overlapping, will tax skill and good judgment to the very utmost in order to make operations that will stand the test of time, either with or without changing their shape.

It is sometimes objected to cutting away the front teeth toward the palate side, that it removes the fold or ridge of enamel at the side of the tooth, and so weakens it and impairs its usefulness for grinding food, and in some instances this may have influence in determining our treatment, but in most cases this fold of enamel is not prominent enough to require any change of the plan of treatment on account of it, and sometimes it had doubtless better be sacrificed than to leave the teeth exposed to recurrence of decay.

We sometimes find teeth with a hollow or longitudinal furrow upon the proximal faces, so that the cervical wall of a cavity in such a tooth will have a notch in it. This can often be obliterated without shouldering the neck of the tooth, by enlarging the V space toward the gum ; if that is impossible, we should make as near approach to it as we can, and leave the groove as broad and shallow as possible, and then the greatest care must be taken to finish down the cervical margin of the filling so as not to leave it overlap-

ping or projecting; the separating file will of course cut down to the tooth near the buccal and palatal side and leaves the hollow untouched; if left so, we may feel sure of renewed decay sometime, at the cervical margin of that filling.

It needs to be said here (as well as always when the preservation of teeth is the subject of discussion,) that careful and constant attention to cleanliness is indispensable to the success of any operation upon the proximal surfaces of teeth; and one principal object to be kept in view in pursuing the line of treatment indicated in this paper, is to give to the tooth pick, the floss silk, and the brush a fair opportunity.

ARTICLE III.

The Part which Vital Action Plays in the History of Dental Caries.

BY DR. H. S. CHASE, ST. LOUIS.

Read before the Illinois State Dental Society.

The various theories in regard to the kind or kinds of action which constitute dental caries, have probably more or less of truth in them all. That the process which produces that disintegration of the dental tissues which is usually called by the name of dental caries, is wholly chemical, or wholly vital, I do not believe. Neither do I think that there is sufficient evidence that fungi assist materially in its development and progress. The great number of observations which have been made in regard to the action which acids have in the disintegration of the dental tissues, have well established the fact that the destruction of tooth substance is mainly produced by chemical decomposition.

I think that the greater number of the members of the dental profession believe that chemical decomposition is the *sole* process in the history of dental decay or dental caries.

Formerly vital action had greater consideration in the production of this disease than it has at the present time;

and it is my object in this paper to present a few thoughts in favor of the vital movements which I believe undoubtedly play an important part in the progress of dental disintegration, and to give to those vital movements a place in the history of this disease which I believe they deserve.

Many persons assume that all vital movements cease in the dentine and cementum when those tissues are fully formed. A still larger number declare that there is no vital action whatever in the enamel substance when *that* is fully formed. I believe that observation will establish facts that will prove these assumptions to be false.

Admitted facts prove that vital processes are the sole cause of the production and completion of all the hard tissues of the teeth. And the history of the shedding of the temporary or milk teeth prove that it is vital action alone which removes the roots and whole body of the dentinal crown. It is easily seen, then, that it is a living movement that builds up the tooth structure to its highest perfection, and also as patent that it is the same process, in a different direction, that takes down, particle by particle, or cell by cell, that same edifice which was so beautifully erected.

Microscopical observations have proven that a barrier of defense is often interposed between a cavity of decay and the dental pulp by an increased calcification of the dentine at that particular location, resulting in an increased hardness and density of the dentine. Here is a vital process again; and this action takes place in the teeth of the middle aged, as well as in those of the young.

Again, in cases of mechanical abrasion, where the teeth are worn down below the thickness of the enamel, we often find the surface of the dentine almost as hard and polished as the enamel itself; and this density of the dentine does not extend to a great depth, but on the contrary, is generally limited to a thin shell of that portion of dentine which is liable to the destructive abrasion, looking very much as though the tooth was endeavoring to protect itself by packing its tubuli with calciferous matter, and thereby forming a wall of defense.

Some of the most careful observers declare that they have known, in their own experience, an absorption of dentine, under a perfect plug, to take place to the extent of exposing the dental pulp; the exposure taking place absolutely without dental decay, and to such an extent that there could be no mistake about it.

A large number of intelligent men are quite sure, from a great number of observations, extending over many years of experience, that the permanent teeth of the adult may become less dense in the structure of the dentine than the same teeth were at a former period; in fact, an interstitial decalcification of that tissue having taken place.

These facts prove, then, that the two opposite processes of calcification and decalcification may, and do take place, in the perfected hard tissues of the teeth, and furthermore, that the basal structure itself, or the animal portion of dentine, may be removed without chemical action.

Beside the foregoing facts, I wish to describe a condition of the enamel and dentine which I have very many times observed, namely: a black or brownish spot is seen on the proximate surface of a molar or bicuspid tooth; it is smooth, hard and glossy; in fact, seems to have as dense a *surface* as glass, or as the uncolored and perfect enamel on the same tooth. A fine excavator, in passing over it, detects no abrasion or disintegration. On cutting into this discolored portion, the tissue appears as solid, for a little distance, as ordinary enamel. The *dentinal* surface of this enamel is somewhat lighter colored than the exterior. As soon as the *dentine* is reached, we observe a softer condition, but the dentine is not discolored, still it seems somewhat decalcified. On proceeding a little further, we find this tissue still softer, caused, apparently, by a *greater* decalcification, and then we come again to normally hard dentine. In all this there is evidently no loss of *basal* structure, either of enamel or dentine, but there is a loss of *substance*, and this is in the *lime* salts of the dentine. It is apparent that there has been *external* loss of tooth substance; there has been no

chemical process taking place; but there has been a vital movement in the interior of the tooth; in fact, among the tubuli themselves, resulting in the process called absorption, the calcareous elements having been carried away through the interior vessels of the tooth, and not by a chemical wasting away from the exterior.

A progressive history of this diseased condition would result in showing, that after a longer period the exterior surface would show signs of disintegration; the surface would become roughened; little pits would be found in it, and on cutting it with an excavator the enamel would be found softened and granular; it would easily break down under the instrument, and show discoloration as deep on its dentinal surface as on its exterior. Beneath the enamel the dentine would show a brownish discoloration, and an entire decalcification for a greater or lesser distance, until the normally hard and healthy dentine is reached.

Now, in this subsequent history of this disease, we probably have more or less chemical action to account for, and an *exterior* loss of substance produced by it. And this exterior chemical action of acids on the enamel will undoubtedly progress toward the interior or dentinal portion of the tooth, as rapidily as a fresh surface is presented by the washing or wasting away of the decomposed tissues.

Pertinent to the subject would be the question: What has caused the condition of things corresponding to the *earlier* history of the tooth described? I answer, *necrosis* of the enamel was produced by pressure of a contiguous tooth, causing the circulation of the blood plasma to cease in the basal substance of the enamel, and discoloration taking place as a consequence of necrosis, as usual. The irritation or inflammation consequent on or simultaneous with this necrotic process caused the vital movement in the dentine which carried away its lime salts.

It must be remembered that irritation of a tissue may produce under, apparently, the same circumstances, either of two opposite vital movements, namely: a loss of sub-

stance, or an increase of substance. This is known to be the case in the bones of the body and in its softer tissues. In the teeth themselves exostosis is caused by the irritation of a dead and decomposing pulp, at other times absorption of the cementum and dentine of the roots takes place from the same cause.

I have already instanced the absorption of dentine under a plug which had irritated the dental pulp by the thermal changes produced by the conducting powers of the metal. At other times the same irritation produced by the same cause calls into activity those vital movements which protect the pulp by a new deposit of dental tissue between the pulp and the plug.

And here we will call to mind, again, that result of vital activity which interposes a denser wall of dentine around a carious cavity in which chemical processes were in the active destruction of tooth substance.

With these facts before us, is it not probable that in many cases of chemical disintegration of the teeth, the irritation produced in the dental tissues causes a vital movement, resulting in rapid decalcification of the dentine, and perhaps also, absorption of the basal or animal substance of that tissue, instead of the opposite process of extra deposition of lime salts in the dentine as a barrier to the decaying process?

It seems to me, from the foregoing observations, that taking a broad view of the process of dental caries, we must give to vital action an important place in its history.

In conclusion, I wish to say that I have read Dr. Chandler's translation of Leber and Rottenstein's Researches on Dental Caries. These authors give great importance to influence produced by the Leptothrix Buccalis, which they say is almost invariably found in all carious dentine and enamel. This fungus is also found upon the tongues and upon the gums of persons who are not particular in cleansing the mouth daily. My conclusions, taking their *observations* as correct, which I believe they are, lead me to consider the Leptothrix as an agent which cannot initiate dental caries,

but as a concomitant of the disease, may accelerate its progress. And I would here take occasion to heartily recommend the work of these authors on this subject to my professional brethren.

SELECTED ARTICLES.

ARTICLE IV.

The Action of Different Medicines Used in Dental Practice.

BY JOHN MURRAY, D. D. S., ROCHESTER, PA.

In attempting to perform the duty assigned to me at this hour, by your Executive Committee, it will be my effort to consider the remedies, or at least a few of the remedies employed by our profession.

If I rightly comprehend the work allotted to me, it is to the sources from which these remedies are derived, the mode of their preparation, their sensible properties, their chemical composition and their relations, their physiological effects, or the effects they are capable of producing in healthy individuals, and their modus operandi. Their therapeutical effects, or those which they produce in morbid states of the system, I shall leave to be discussed by my brother essayist who has that theme committed to his especial care.

To facilitate a uniform nomenclature and dispensation of medicines, authoritative works have been issued in London, Paris, Dublin and in the United States, termed Pharmaco-

pœia. The Pharmacopœia of the United States was first published by the authority of a convention held at Washington in the year 1820, and it has since been revised every ten years. It furnishes a list of articles which are in general use, and supplies formulæ for such preparations as are kept in the shops, and which are thence termed offecinal, from the Latin word *offecina*, a shop.

The unbounded credulity which at one time prevailed regarding the effects of drugs, has now almost passed away, and we observe less and less of the old feeling of confidence in the adaptation of particular drugs to peculiar cases of disease. The plan now is, to discover the seat and nature of diseased action, and to adapt a remedy whose properties are known, to the exigency, locally or generally, as the case may require. We have no agents that are possessed of specific properties which are exerted with unerring certainty and uniformity on disease. Although we may be perfectly acquainted with the ordinary medicinal properties of a drug, and although these properties may be essentially the same, the agency exerted by it may be different according to the sex, temperament, &c., of the patient. Were these points determinate, we could always calculate with a certainty what would be the precise action of any medicinal agent. Medicines are capable of affecting every tissue and every function, directly or indirectly. It must be remembered that however faithfully and correctly the ordinary action of medicines may be set forth, the ordinary allowance must be made for surrounding circumstances.

Prior to entering upon the main feature of my subject—the action of medicines—it may not be considered out of place to spend a few moments on the modus operandi of medicines upon living subjects or substances.

There are two general methods by which the impressions of medicines are obtained: 1st. When it is desired that an impression shall be made at some remote part of the body, or when it is desired that it shall permeate every part the exhibition is internal. When a drug is taken into the

stomach, it may merely affect that organ by simple contact. This is the simplest mode in which medicinal agents act. When a drug is permitted to remain as part of the contents of the stomach for any considerable length of time, other parts become impressed according to the elective affinity of the particular article for some tissue or organ rather than another. The precise mode of operation by which this is brought about has been a subject of controversy. All writers of modern date agree that this process is accomplished by the circulation. The absorbents take up the particles and pass them into the blood, and so transmit them to remote parts of the body. This is the method that is mainly relied upon by the general practitioner. There is another mode of using remedies, and one to our profession of equal if not greater importance and interest than the former—the topical or local application of remedies or medicines. If, in this mode of their application, we are denied the active system of absorbents, and the circulation to accomplish the desired end, we at least have the advantage of a direct and local application to the very spot desired to be reached. But while our dependence is principally upon the local or topical application of remedies, we hold to the opinion that the system is abundantly able to appropriate these local remedies to its local necessities. The experience that has been furnished by many years of practice and observation, has taught us, and the whole profession, that there are a limited number of medicines which, topically applied, not only make a decided impression upon the immediate locality, but carried by capillary absorption or other agents, reach points remote from the place of application. "Headland states, that some few substances may act locally by irritation or otherwise, on the mucous surfaces of the stomach or intestines. These are not many; they act without being absorbed, and they may not extend into the system at large. In some few cases these local actions may be succeeded by changes in distant parts on the principle of revulsion." As the living body is supplied with a regular and perfect system

of secretary organs by which every part is thoroughly relieved of every particle of effete matter, so nature has provided us with a no less perfect, efficient and universal system of absorbents, whose office it is to take up and appropriate whatever may be necessary to the sustenance and health of the individual. While the cuticle is destitute of a living organism, yet it is not incapable of imbibition, but is subject to the general law of endosmosis. May not the numerous orifices which open upon the cuticle perform the double office of secretion and absorption? It is well known that persons suffering from excessive thirst will have it very much assuaged by partial immersion in water. This must be accounted for by the law of absorption or imbibition through the innumerable apertures of the skin. Now what has been asserted in reference to the powers and capabilities of the soft tissues to appropriate to their varied wants whatever may be within their reach, may also with equal propriety and confidence be asserted in regard to the hard tissues, and particularly of dentine. Dentine itself, considered as a living substance, and without any regard to its internal structure of vessels, or its sympathetic external surroundings of blood vessels, gums, nerves, &c., possesses a living organization that will justify the conclusion that through its numerous tubuli it will convey to its remotest portions influences that may be topically put within its reach. What the tooth cannot do of itself, in consequence of the low degree it holds in the scale of vitality, its pulp and system of nerves and blood vessels, will fully and perfectly accomplish. Who of us has not experienced the capability of a tooth to absorb arsenious acid to its own destruction and that of its adjacent tooth or teeth.

With these preliminary remarks on general principles connected more or less intimately with the action of medicines that are the most extensively employed in the practice of our profession.

Prominent in the list of the Dental Materia stands Creosote first to be adopted and last to be abandoned. It has

been honored by a distinguished name of which it has proved itself worthy, signifying in the Greek, flesh preserver.

The London and Paris Pharmacopœias give the following mode of its preparation: Distil wood tar in an iron retort until white vapors appear; collect the heavy, oily matter which forms the lower layer of the product, wash it with water slightly acidulated with sulphuric acid; then distil it in a glass retort, rejecting the first portions, which are chiefly euopione, and heat the product with a solution of potassa sp. gr. 1, 12, shaking the mixture strongly. When it has settled pour off the layer of euopoine, from the surface and expose the combined potash and creosote to the air until it becomes black, then saturate with dilute sulphuric acid, pour away the watery liquid and distil the product in glass. Repeat the treatment by exposure, potash, sulphuric acid and distillation three times or oftener, until the combination of creosote and potash ceases to become colored by the action of the air, then saturate it with concentrated phosphoric acid, and distil the creosote, rejecting the first portions..

This drug, when obtained in its purity, is one of our most valuable remedies. In connection with the above-named remedy, and before I proceed to give its medical properties, I may introduce carbolic acid, as these two substances so closely resemble each other in appearance, odor, and general properties—the one being a distillation of wood-tar, and the other a distillation of coal-tar. Their therapeutical properties are similar, and may therefore be given together.

They are both antiseptics, stimulants, styptics irritant and escharotics, and to creosote some add that of nervine. They both unite with albumen and gelatine, forming with them insoluble compounds. They possess the property of promoting healthy granulations and hastening the healing process. They relieve pain without causing inflammation. They are valuable agents in arresting the process of supuration. They are considered very efficient in arresting, temporarily, the pain arising from an exposed pulp, and also in rendering a

cavity less sensitive. Some good practitioners are in the habit of washing out the cavity with creosote immediately prior to filling. Many other uses will suggest themselves to the dental practitioner. Indeed, it is considered indispensable to our success. The great importance of this medicine will justify the time and attention that has been bestowed upon it in this essay.

Your attention will next be called to that important class of medicines, astringents proper. Although the two preceding possess this property in common with others, yet it is not their distinguishing characteristic. Astringents are few and entirely distinct in their mode of operation from all others. They do not necessarily act in the blood, although many haematics are also astringents. They do not pass from the blood to the nerves. As neurotics act directly on nerves, so these act directly and especially on muscular tissue or fiber. They cause this to contract, whether it be striped and voluntary, or of the involuntary and unstriped kind. Taken into the blood in a state of solution, they pass through the walls of the capillaries to the muscular tissue.

The greatest and most valuable of all the vegetable astringents is Tannin—Acidum Tannicum. With this astringent at hand we could almost afford to dispense with all others. This remedy is obtained by causing commercial sulphuric ether to percolate through pounded galls in a glass adopter, closed at the lower end with carded cotton. The liquor obtained separates in two parts; pour off the upper layer and evaporate the lower portion with a moderate heat to dryness.

This medicine is purely an astringent. Its principal use in dentistry is as a styptic in hemorrhage, relaxation of the uvula, and in chronic inflammation of the fauces. It, like creosote and carbolic acid, combines with albumen, fibrin, and gelatin, and forms in this case an insoluble tanate, thus preserving the parts beneath from the influence of irritating agents, till the case has time to terminate in resolution.

Having considered the principal vegetable astringent as the type of the class, it may now be proper to take up the principal metalic astringent or styptic, which I take to be Ferri Chloridum. What tannin is in the vegetable kingdom, ferri chloridum is in the mineral kingdom. With these two agents in our possession we needhardly encumber our office with any others.

The proto-chloride is made by dissolving clean iron turnings in muriatic acid, boiling the solution on excess of iron, decanting as soon as settled, and evaporating quickly to dryness. The perchloride is made by evaporating to dryness a solution of red oxide of iron in muriatic acid. I need only say that this is a powerful astringent and styptic, and may be used in place of the tannin for these purposes if desired.

Acidum Sulphuricum is of sp. gr. 1,845. This acid with its officinal arromaticum has come extensively into use by dentists in the treatment of diseased osseous and dentine structures, as well as in alveolar abscess. The elixir of vitriol is composed of the following proportions: Sulphuric acid, f.ziii. ss; ginger bruised, zi; cinnamon, zi. ss; Alcohol, oil. Digest the alcohol and acid together for three days, then add the ginger and cinnamon and macerate for a week; lastly, filter through paper.

In general practice it is used as an astringent, tonic and refrigerant, but in dental practice it is depended upon to break up and remove unhealthy bone and dentine, dental calculi, and destroy indolent ulcers. Such is its affinity for lime salts, that it should be used with great caution.

Oxalic Acid, the great bleaching agent, has been highly recommended for bleaching teeth. This, under certain circumstances, may prove a very efficient agent, especially when the discoloration is produced by the salts of iron. A tooth congested with red blood globules may be very properly created with this agent; but it must be remembered that this acid has a great affinity for lime salts, and therefore must not remain long in contact with tooth substance.

Argenti Nitras, Lunar Costic, was formerly and perhaps is to some extent yet, used by the dental profession. It is obtained by dissolving zi. of silver in a mixture of f.3v. of nitric acid, f.zii of distilled water on a sand bath. Evaporate the solution to dryness, fuse and pour into moulds. *Medical properties*, tonic, antispasmodic, applied externally, it is a stimulant and escharotic. Like sulphate of copper, sulphate of zinc and acetate of lead, it forms a coagulum with albumen, but the clot is soluble in an excess of albumen, while that formed by tannic acid, perchloride and persulphate of iron is not soluble in albumen or any other constituent of the blood. It is a powerful caustic when applied to the soft parts, or to the bony tissues. It acts upon the gelatinous portions of the tooth, destroying its vitality to the extent of the combination that takes place. It is an active poison, but can be neuteralized by a strong solution of common salts, which converts it into chloride of silver.

There is a class of medicines termed neurotics, from neuron, a nerve. This class of medicines is temporary in its action. They influence the nervous system, exciting it, depressing it, or otherwise altering its tone. They are chiefly useful in the temporary emergencies of acute disorders. They can seldom effect a permanent cure, unless when the contingency in which they are administered is also of a temporary nature. Neurotics pass out of the blood to the nerves which they influence. It is further affirmed that they are transitory in their action. They appear to effect molecular changes in the nerve fiber, similar to those by which the phenomena of the senses are produced, and which are by nature transitory in their results. There are three divisions of neurotics. The first set are of use when there is a dangerous deficiency of vital action. These are stimulants. They exalt nervous force, either of the whole nervous system or only of a part of it. A second class, called narcotics, first exalt nervous force and then depress it —they have thus a double action; but they have also a

peculiar influence over the functions of the brain, which is different from any possessed by any nerve medicine. They control the intellectual part of the brain as distinguished from its organic functions; the powers of *mind* more than those of *life*. Some narcotics tend to produce inebriation, others sleep, others again delirium. Again, some neurotics tend simply and primarily to depress nervous force, and are said to have a sedative effect; but to have any permanent effect they must be constantly repeated. Neurotics may be further considered under three general divisions, viz: 1st. Narcotics or cerebral, such as opium, prussic acid, alcohol, chloroform, camphor, tobacco, coculus indicus, &c. 2nd. Spinal, including nux vomica, strychnia, &c. Then there is a third class called cerebro-spinal, including hemlock, monk's hood or aconite, belladonna, lobelia, digitalis, &c. The action of these classes is indicated by their names or classification. The cerebral acting on the cerebrum, the spinal acting on the spinal cord, and the cerebro-spinal on both cerebrum and spinal cord.

For some reason, no doubt good and sufficient, the dental profession has shown a decided preference for that class of neurotics called cerebro-spinal, nearly to the exclusion of all others. It is most probable that these cerebro-spinal agents, such as aconite, is selected for its known properties or powers to affect the nerves of sensation, by exciting, depressing, or destroying sensibility. These neurotics are almost invariably virulent poisons, and must be used with great care and skill. Dentists use these drugs externally to an inflamed nerve, by the use of which they expect to produce sedative influence, to lower the degree of excitability, or perhaps temporarily to paralyze the part. Aconitum and belladonna have been the two principal agents relied on by dentists. The tincture of aconite is sufficiently strong for topical application. The active principle, or alkaloid, should not be employed. Belladonna belongs to the same class of neurotics and is possessed of similar properties, and must be used with the same caution.

In this essay I have referred to about six or eight medicines that I considered the most prominent and useful in the Dental Materia Medica. The time and space allotted to this essay will not justify the introduction of any more at present. In conclusion, I would call the attention of the members of this association to the fact, that the field of research has been and still is entirely too limited in the department of Dental Materia Medica. The mechanical department has made great advancement, producing many invaluable improvements; but the scientific department has been sadly neglected. Science should keep pace with art. Educated men occupying favorable situations in large cities, where there are opportunities to experiment, should investigate the properties of the untried neurotics, in hope that that some latent power might be brought forth which would be of great advantage to the dental profession. There is at present great diversity of opinion existing among our leading men on the treatment of dental disease, each one advancing a theory differing from all others. Each new theory runs its course in a short time and is abandoned to give place to another. This state of things goes to show that our theories are only in their formative state, and need time, sound judgment and scientific research to settle upon some sound and uniform method of practice. Theories, crude and unproved, are set forth with too much confidence, and adopted by many, only to be abandoned as worthless, or perhaps injurious, after a short trial. Judging by the progress that dentistry has made in the past quarter of a century, we have reason to be encouraged. The light of a brighter day is dawning when dentistry will stand pre-eminent among its sister professions.—*Lake Erie Dental Association—Penn. Journal of Dental Science.*

ARTICLE V.

On Amalgams.

BY AMOS KIRBY, ESQ., L. D. S.

In fulfilment of my promise, I send a short account of some experiments with amalgams for stopping teeth, and

which I have not published except as a casual communication to the Odontological Society.

Before Mr. C. S. Tomes' interesting experiments on the changes in specific gravity in amalgams during hardening, I believe no attempt had been made to determine with exactness the behaviour of those substances.

Wishing to verify Mr. Tomes' results by other methods, as well as to make further practical investigations, I had apparatus made of two or three kinds for measuring very small changes of bulk. The most useful of these was a small screw micrometer attached to the movable end of a metal box, which could be filled with samples of the substance to be observed, so that any changes in their diameter could be measured, and as the pieces could be readily removed and replaced again, they could be re-measured at any interval of time.

Some of the stoppings in general use were tried, and found to contract, as a rule, but not always to the same extent; one of the best did so usually to about 16–10,000th (.0016) of its diameter; but in these and all other amalgams tried, whether they expanded or contracted, the changes went on for some hours, or even days, after they had become perfectly hard.

Precipitated silver amalgam being the only substance of the kind which had been supposed to expand, was tested, and some samples did so to the extent of about 1–40th of their diameter, (.025,) but contrary to expectation, pure filed silver also acted in exactly the same way, expanding for several days. From this I supposed that amalgams made with more silver (in proportion to the tin) than has been ordinarily used, would probably expand; and found that such was the case. A large excess of silver, however, made the amalgam too brittle, and caused discoloration, whilst better results followed with a small excess of that metal.

The best results seemed to be obtained when the quantities of silver and tin bore relation to their atomic weights, and the addition of a little gold made the paste more plastic as well as causing it to set more rapidly.

Two atoms of silver to one of tin, with about seven per cent. of gold, produced, with an equal weight of mercury, (more being required if the fillings are new,) an amalgam which expanded from 16–10,000ths to 50–10,000ths, an amount sufficient to insure (other things being favorable) perfect tightness in a plug without causing danger to a frail tooth.

Amalgam made from an alloy in the proportion of three atoms of silver to two of tin, with seven per cent. of gold, expanded slightly, and seems to stand well in the mouth without discoloring much or being too brittle—say,

Silver	162 grains.
Tin	118 "
Gold	20 "

Or, roughly—

Silver	4 dwts.
Tin	3 "
Gold	½ "

These are melted and reduced to fillings, which should not be used for two or three weeks; about an equal weight of mercury is added to form a paste.

This and other amalgams containing an excess of silver expand, as a rule, but not always to the same extent—and sometimes even contract slightly, or contract first and expand afterwards, or they occasionally expand first, or contract first, and then regain and retain their original size.

An unexpected phenomenon of a very important nature followed the hardening of the first samples of stopping tested in the micrometer box and in all, which were used in a dry condition, but was particularly remarked in some new kinds which were said by the vendor not to change in shape at all when used in a dry state; i. e. with very little mercury. It consisted in so great a change in the shape of the mass or bar of stopping after hardening, as often to prevent its being again introduced into the box for measurement, and was always attended by a contraction and shrinking of the middle part of the surface, (the portion last introduced)

with a turning up and in toward the centre of the edge of the mass. When the mass was in the form of a long bar, the ends bent up like a bow.

This tendency to change of shape proved to be independent of the composition of the stopping, and of its general expansion or contraction, and depended entirely on the quantity of mercury with which it was mixed, or rather on the unequal distribution of the mercury through the mass when only a small proportion of it was used. It is in itself fatal to the efficiency of any stopping in which it takes place, but may be prevented or reduced to a minimum by care in packing, using a moderately soft paste, and drying the mercury out of the surface of the stopping with a very dry lump of amalgam used as a sponge, squeezing out the mercury it has absorbed, and applying it again and again.

It appears that when the amalgam is used in a dry state, the pressure of the instrument in packing, squeezes some of the mercury to the surface, however little there may be in it, so that the last portion of stopping introduced contains more of that substance than the first; some time afterward, however a more equal distribution takes place—the first or dryer portion taking away mercury from the latter portion, expands in the process, whilst the part which has lost mercury contracts in consequence.

If, however, the first part is soft when introduced, it is easy to use the last portion dryer, and so insure equal distribution. In practice I found that the dryer the amalgam the greater the distortion ; and that when used as stated above, little or no change followed.

Another test which I contrived consisted, in its first form, in introducing amalgam into short pieces of glass tube closed at one end, in order to see if any air space was formed between the two; some of the shrinking amalgams fell out of these tubes after a few days, but those made of pure silver occasionally split the tubes in two, although in some cases the tube remained unbroken, while the silver projected from the open end, and after being ground off level, projected again next day.

These tubes were afterwards placed in a vessel containing Judson's blue dye, but unless the shrinkage in the amalgam had been very great, the color did not find its way between the glass and the stopping; the vessel containing them was therefore put under an air pump, and after partial exhaustion of the air, the color found its way into all those which were not perfect. Some tubes filled with silver amalgam were quite proof against the color, and some with the expanding amalgam named above were good when the surface had been well dried from mercury, but none of the bought fillings stood the test, and great care was needed to enable any to do so.

From this experiment it is evident that the "ink test," as recommended by Mr. Fletcher, is not reliable, and I am sorry to find by the micrometer test, that a sample of his new "expanding amalgam," which has no doubt been tested by it, is by no means perfect, but contracts when used with a moderate quantity of mercury.

Amalgams with a large quantity of silver have long been used with the same method of drying the surface, and in many cases useful results have followed the less careful use of imperfect materials, but it is certain that all amalgams must be looked upon as capricious in their behavior and not thoroughly reliable.

As we are yet without a reliable plastic filling, the newest and best of the oxychlorides dissolving in a year in some mouths, whilst it endures much longer in others, the relative merits of gold used in its different forms is a question of the the greatest importance, and it is satisfactory to know that experiments are being made by able hands with a view to deciding the subject. Judging from some of the physical properties of the two, I have long thought that the use of non-adhesive gold is to be preferred, but chiefly from the ease with which it may be condensed (a process which in this case may be compared to the caulking of a wooden ship,) by which moisture is perfectly excluded if the gold has been previously made fairly solid. Although the adhesive stop-

ping may be much harder and more solid, it is like the hard material of an iron ship or steam boiler, the seams of which appear to be quite close after they are riveted, whilst in fact, they readily allow the passage of moisture. In the iron ship this is remedied by a process of caulking different to the one used for wooden vessels, and inapplicable in the case of teeth stopped with adhesive gold, from that substance being harder than the tooth, which, from its brittleness, is unable to bear the force necessary for efficient caulking of the harder substance.

There are not many tooth cavities of a form which cannot be filled with soft gold, and since pellets of from one to two grains of No. 6 foil may be packed or made solid by the aid of the mallet, before introducing more, it is not difficult to build large stoppings rapidily, and when the surface has been well hammered it is a matter of some labor to cut it away for the accommodation of the cusps of an antagonizing tooth.

Without being able to throw any new light on the processes used in making non-adhesive stoppings, it is well to call them to mind for use in some cases where one might without them be tempted to use amalgam. The mallet, both for building and condensing large fillings cannot be too highly prized, and for the former process the straight lever mallet instrument, of which I some time ago gave patterns to Messrs. Ash and Collins, answers every purpose; while for condensing the surface of crown cavities, I have used special instruments of simple construction with very short blades; these are very much more efficient than any of those in ordinary use, which from the curves in the shaft necessary to enable the operator to reach the part, are quite inefficient, anything beyond the slightest bend acting as a spring and absorbing all the force of the blow. The mallets named have not been made except for my own use. They are very convenient, as they enable the operator to condense from behind forward, and I shall be happy to give drawings of them.—*British Jour. of Dental Science.*

ARTICLE VI.

Annual Meeting of American Dental Association.

The fourteenth annual meeting of the American Dental Association was held in the city of Detroit, commencing August 4th and closing August 7th.

The officers elected for the ensuing year were: President—M. S. Dean, Chicago. Vice-Presidents—Geo. W. Keely, Oxford, Ohio; James S. Knapp, New Orleans. Corresponding Secretary—George L. Field, Detroit. Recording Secretary—C. S. Smith, Springfield, Ill. Treasurer—W. H. Goddard, Louisville, Ky. Executive Committee—G. H. Cushing, L. D. Shepard, Geo. L. Field, H. A. Smith, G. R. Thomas, S. B. Palmer, G. C. Daboll, A. L. Brockway.

The Executive Committee announced the following Standing Committees:

On Physiology—Drs. J. N. McQuillen, E. S. Gaylord, J. I. Walker.

On Pathology—Drs. H. Judd, L. D. Shepard, J. S. Knapp.

On History and Microscopy—Drs. J. Taft, E. D. Swayne, W. H. Jackson.

On Chemistry—Drs. H. A. Smith, S. B. Palmer, J. S. Cassiday.

On Therapeutics—Drs. E. A. Bogue, W. O. Kulp, C. C. Carroll.

On Operative Dentistry—Drs. G. H. Cushing, C. S. Stockton, S. H. McCall.

On Mechanical Dentistry—Drs. J. H. Rehwinkle, J. F. Canine, J. Johnson.

On Dental Education—Drs. G. W. Keely, A. H. Brockway, S. Welchens.

On Etiology—Drs. H. S. Chase, E. C. Hawkhurst, C. S. Smith.

On Prize Essays—Drs. Forbes, G. L. Field, R. B. Donaldson.

Niagara Falls was fixed upon as the place of holding the next annual meeting, commencing on the first Tuesday in August, 1875.

During the discussion of the report on Dental Education the following resolutions were offered and laid over till next meeting. We publish them as indicative of the feeling expressed by the members present on this important question.

Resolved, That it is the sense of this Association that no dental student should be graduated by any dental college without at least three years' instruction, including private pupilage and college instruction. The latter should in no case embrace less than two regular full courses.

Resolved, That the association suggest to the different colleges of this country to appoint a common examining committee, consisting of five members, three to be a quorum, none of whom shall be in connection with any dental college, whose duty it shall be to examine all applicants for graduation and decide upon the same.

Resolved, That this associatoin recommend to all local societies the adoption of rules prohibiting their members from taking students for a less period than three years, or for such time as will complete a three years' pupilage.

Dr Allport gave notice that he would, at the next session of the association, bring in an amendment to the constitution requiring that one of the requisites for membership in the association in any dentist who shall begin practice, from and after this time, shall be that he be a graduate either of a medical or dental college.

We see that by a resolution passed at this meeting that members of the profession or dental societies desiring a copy of the Transactions for 1873, can procure them free of cost by addressing the Treasurer, Dr. Goddard, Louisville, and paying postage.—*Missouri Dental Journal.*

ARTICLE VII.

A Safe and Simple Method for Self-administration of Chloroform.

BY WM. WALTER LANE, M. D., WILMINGTON, N. C.

I noticed in the last Transactions of the State Medical Society of Virginia, that during a discussion on the use of chloroform in disease, Dr. Jenks spoke of his being a great sufferer from some heart trouble, and gave his method of self-administration, which struck me as not only being dangerous, but an expensive way. He says that he is in the habit of carrying to bed with him a pound bottle of chloroform one-fourth full, which he inhales until easy, or finds himself going to sleep, when he sets the bottle aside. But sometimes he becomes unexpectedly unconscious, the bottle falls from his hands, the contents emptied in bed, and he is awakened by the burning sensation imparted to the skin by the chloroform.

Having suffered some time ago with very severe attacks of hepatic colic, induced by the passage of biliary calculia, and having had occasion many times to administer this agent to myself, and often when I was alone, I thought I would offer through your Journal, to those in the habit of taking chloroform, a safer and simpler method, and much more economical than the one used by Dr. Jenks.

I take a small paper pill box filled with raw cotton, or lint, on which I pour a sufficient quantity of chloroform to saturate well, then lying on the back with the head slightly raised, with neck and chest exposed, and with a light handkerchief thrown over the box, the latter is held by one or both hands to the face in an elevated position, with the elbows suspended as it were above the chest. As soon as anæsthesia is produced, the arms, along with the hands containing box and handkerchief, fall upon the body, thereby avoiding all tendency to suffocation and excessive dose of the anæsthetic.

This manner of taking chloroform I have recently adopted, without the least unpleasant consequence, when suffering the most violent pain our frames are subject to.—*Am. Med. Weekly.*

ARTICLE VIII.

Carvacrol.

BY E. A. BOGUE, M. D., NEW YORK.

This substance, when first introduced to the profession, was of such a disagreeable odor, and so unpleasant to handle, that it was almost impossible to use it. It is now, however, thanks to the efforts of Dr. Sage, being furnished in an almost unobjectionable form; and as it has one or two qualities certainly, that commend it to use, it will be well to notice any new ones, as they may be discovered. One of these qualities, which was, I think, first noticed by Dr. A. L. Northrop, is its property of dissolving gutta percha; especially when the latter is warmed. Hence, if Carvacrol has been put into a sensitive cavity, a thin layer of gutta percha, or Hill's stopping, may be spread evenly over the bottom, without drying the cavity out; thus making use of the solvent property of the Carvacrol, while it is doing its work in allaying sensitiveness; or the cavity may be completely filled, and the burnisher moistened with the surplus Carvacrol, will finish the filling much more smoothly than usual, if finished in the ordinary way. For the insertion of root fillings, in cases where gutta percha is desirable, and for a great deal of the patching that requires to be done, where pivot teeth have been worn for a good many years, and where oxy-chlo. zinc is not admissible, Carvacrol proves a very valuable adjunct.—*Johnston's Dental Miscellany.*

EDITORIAL. ETC.

Vulcanite Litigation.—We are indebted to Dr. S. S. White for advance sheet of October *Cosmos*, containing the following information concerning the Vulcanite Litigation:

"Since our last mention of the suit against Dr. Smith, and its decision by Judge Shepley, the final decree has been entered in conformity with that decision, and with the proceedings taken thereupon, and this decree bears date August 18th, 1874.

Since that time all the necessary formalities have been complied with, (the supersedeas bond filed, etc.,) and an appeal to the Supreme Court of the United States duly perfected, thus arresting the execution of the judgment against Dr. Smith.

Between the taking of an appeal and the hearing of it, it is well known a considerable time must elapse, because the docket of the Supreme Court is always a long one, and cases, as a rule, are heard in numerical order. We have therefore only to wait until Dr. Smith's turn comes. When a case is argued the Court decides it very promptly. Nothing can be done to hurry it, and it only needs that the profession bear in mind the foregoing facts whenever any suggestion occurs as to why the appeal is not heard of for a season.

At this point we deem it proper to add a word. During the somewhat similar interval that has elapsed since the decision by Judge Shepley, all sorts of assertions, statements, and surmises have been made or indulged, and have reached us through divers channels, coming from parties interested in one way or another, and having an object or purpose that could readily be comprehended. The word we wish to add is simply that since the decision by Judge Shepley nothing has be done in the Smith case, except with a view to obtaining the final decree on one side, and the securing of an appeal on the other; and in the latter proceeding the ten days allowed by law, from August 18th, were

more than sufficient. Thus at the earliest practical moment the case has been placed in train for ultimate disposition, and the programme originally contemplated, in the stipulation adopting this as a test case, fully and promptly carried out up to date.

Futhermore, in regard to the cases in other circuits where Judge Shepley's opinion has been adopted and acted upon, this also was contemplated in the acceptance of a test case, and the proceedings elsewhere, in what may be called these collateral cases, have simply been the natural and expected consequences of the Massachusetts decision.

As we understand it, the Michigan cases are governed by a specific stipulation applying exclusively to them, (as the original stipulation in the Smith case applied only to the Pennsylvania, New Jersey, and Delaware cases,) and are waiting a hearing in Michigan, (as the other cases awaited the hearing before Judge Shepley,) all further proceedings in that circuit being suspended until such hearing and decision.

Since the appeal of the Gardner suit was dismissed and the mandate recalled by the United States Supreme Court, on the ground that that suit both below and above was *merely collusive*, the conduct of the defense has been in harmony with the purpose resulting from the desire then expressed by leading men in the dental profession, that the undersigned would take charge of the preparation, illustration, and presentation of the processes, and products of those processes, which had been in public use and on sale by the dental profession long before the alleged claims of invention by Dr. Cummins, and which had so strangely been omitted from the Gardner record, although their effect has been at least to change the character of the patent entirely, as now construed both by the Company and the Court. The Goodyear Dental Vulcanite Company declining to argue the original cases in this circuit, permitting their preliminary suits to go by, paying the costs and renewing them again, their offer to make the Smith case the test case was accepted, as affording the earliest opportunity of having the matter heard on its merits.

The case having been fully presented before a Circuit Court, and having now been appealed to the Supreme Court without delay, will be finally argued there in its turn.

It will therefore be evident to the profession that there has been no disposition to provoke litigation, and no litigation

resorted to further than was necessary to present the facts properly for conclusive adjudication.

SAMUEL S. WHITE.

How to Use Plastic Fillings.—Thos. Fletcher, F. C. S., writes as follows upon this subject:

"Of all conditions necessary for a filling which hardens after the operator leaves it, none is more imperative than *the absolute dryness of the cavity.* Neglect of this entails certain failure in every case as regards the production of a really perfect plug. With gold or tin, which can be wedged, and which are hard and safe the moment they are left, the absolute exclusion of moisture is of little importance in comparison; but with a plastic filling it is the necessary condition above all others; and I believe from experience that the neglect of this vital point causes the failure of more amalgam plugs than all other causes of every kind put together. When an amalgam plug is inserted in a cavity containing moisture, a trace is always left between the plug and the tooth substance which no amount of force will drive out. When the pressure of the instrument is removed the moisture gradually forces its way back until it forms a layer all over the cavity, the force of capillary action being quite sufficient to alter the form of hardest amalgam before it is set, and to produce a space between the plug and tooth which may be distinctly felt with a fine probe in a few hours or days. The action of moisture may be rendered distinctly visible by packing a plug in a wet cavity of glass, covered with a colored solution, and watching the result. If the cavity is perfectly dry the moisture has no power to penetrate between the plug and the tooth, unless the plug shrinks or is disturbed whilst soft.

In cavities difficult to keep dry the best safeguard is the free use (after drying as perfectly as possible) of a solution of gum copal in ether or resin in carbolic acid. The latter not only hardens the dentine but offers very great resistance to the passage of moisture. Prepare the cavity, dry it and pack firmly in a plug of amadou soaked in the resin and carbolic acid solution, leaving it in whilst the amalgam is prepared. Then remove the plug, wipe out the cavity with a similar one, and afterwards with dry amadou. If the amalgam can be got into contact with

the walls of the cavity before moisture penetrates, it is safe; if not, it is better to try again rather than risk eventual failure. If this treatment is carried out and an amalgam is used which is free from shrinkage, the line joining the plug and tooth is inappreciable to the finest probe months or years afterwards; if the moisture has obtained entrance, the division can be felt in a day or two at most—generally in a few hours. An operator who forgets this or overlooks its importance damages his own reputation and the reputation of amalgams also, without a just cause. An amalgam properly made and properly worked is absolutely safe as a permanent filling; and the operator may blame his own neglect for every failure."

MONTHLY SUMMARY.

School Diseases.—It is a serious question whether we are not getting what is called education at too exorbitant a price, when the health and usefulness of the eyes are impaired or sacrificed. And the mischief that is done to eyes in schools and colleges may safely be taken as an indication of the damage that is inflicted upon other parts of the body. Objectors may, perhaps, say that the appalling statistics obtained by the foreign observers could not be gathered in American schools and colleges. I believe that they might, and I found my belief upon twenty years' work among just the classes of subjects tabulated by Cohn and other Continental observers. I believe that our system of education, if, indeed, we may be said to have a system, is one of the most damaging in its effects upon the growing bodies of scholars of any in the world. Let any one familiar with hygiene take the pains, as I have, to enquire carefully into the physical effects of curricula of our leading schools and colleges, and he will be compelled to confess that there is the greatest cause for reform. The attention which is paid to gymnastic exercises and other

methods of physical culture does not correct the evils. It often happens that those who really need physical exercise most do not get it, or that the exercise is excessive, and does harm to those who engage in it. What we need in our school and college curricula is a diminution of the hours of labor. The working hours too often extend from eight or nine in the morning to ten or eleven at night. The strain thus put upon growing bodies is too great. Some method should be devised by which much that now involves a persistent use of the eyes in confined and unnatural postures of the body could be accomplished through the use of models or photographs, or the blackboard. Much that is now attempted to be taught by badly-printed books might be taught orally or by some form of object lessons. Even if such radical changes could not be accomplished, much might be done towards lessening the evil effects of our present method by shortening the hours devoted to study, by correcting defects in the architecture of class and study rooms, by improving the ventilation, heating, and lighting of school-houses, and by diffusing information among the parents of scholars, so that there may be less in the home-life that is prejudicial to health. And just here we touch the very fountain of the evil. Our schools cannot be much, if any, above the intelligence of their patrons. I do not blame the teachers for the evils in our systems of education. I blame boards of trustees and other school and college boards for not applying the principles that have already been worked out by scientific men. If architects and boards of managers of schools and colleges would apply in the construction and conduct of their institutions of learning even a few of the principles that sanitarians all agree upon, we would at once see a reduction in those forms of disease which are traceable to their present neglect.—*C. R. Agnew, M. D., Sanitarian.*

Camphorated Phenol.—In a note on this subject *Campania Medica and Gazetta Medica Italiana-Lombardia*, November 8, after noticing the chemical and therapeutic properties of carbolic acid, Bufalini goes on to speak of its behaviour when combined with camphor.

In making experiments with carbolic acid for the purpose of preserving animal substance from putrefaction, Bufalini met with a peculiar phenomenon when it was in contact with camphor. When about equal parts of carbolic acid and camphor are dissolved in alcohol, in about twelve or thirteen hours there arises to the surface of the solution a yellowish stratum of oily appearance; it does not mix with the liquid or water, nor is the camphor contained in the alcohol precipitated by water. All this indicates that a chemical combination has taken place, forming a substance which Bufalini calls camphorated phenol.

In preparing this compound, Bufalini prefers the two following methods. In the first, one part of carbolic acid and two of camphor broken into small pieces are mixed in a vessel and allowed to stand for some hours, when a reddish yellow oily liquid will be formed; this is camphorated phenol, which is purified by washing with cold water. The second method consists in dissolving three parts of carbolic acid in ten of alcohol, and five of camphor in twelve of alcohol, mixing the solution in a wide-mouthed vessel, and allowing the mixture to stand for a day or two; the camphorated phenol rises to the top, and may be removed by simple decantation.

Prepared in either of these ways, camphorated phenol is a liquid of oily appearance, reddish yellow or wine-red in colour, having a smell of camphor, insoluble in water, but soluble in alcohol and ether.

Regarding its therapeutic uses, the author gives the following as his conclusions.

1. Camphorated phenol produces the same effects as carbolic acid, but is less dangerous. It may be used both externally and internally—*e. g.* in enteric fever and other infectious disorders.

2. It has the power of modifying unhealthy wounds, and of destroying the parasites which are present in certain diseases, as septicæmia, typhoid forms of fever, etc.

3. The medical use of camphorated phenol is to be preferred to that of carbolic acid, as the former does not present the disadvantages of the latter.

4. Camphorated phenol, when applied to the wounds, does not irritate them, or act as a caustic, or disorganizing substance on them; and may be used in large doses, without producing symptoms of poisoning.—*London Med. Record.*

Anæsthetization During Sleep.—In reply to the oft-asked question, "Can a person be anæsthetized during sleep?" Dr. W. R. Cluness reports (*Pacific Med. and Surg. Journ.*, June, 1874) two cases of successful chloroformization during sleep.

The first case was that of a girl aged eight years, in whom, as a sequel to acute otitis media, the mastoid cells of one side became inflamed. Dr. E. M. Curtis deemed it expedient to operate for the evacuation of the pus, and met me the following morning for this purpose. On our arrival we learned that our patient had slept but little during the night, but was then sleeping sweetly. Chloroform was at once administered upon a four-by-six piece of surgeon's lint, held as near the child's mouth as possible without coming in actual contact. Not the slightest effort was made by the child to avoid the inhalation of the anæsthetic, and in a few moments she was well under its influence,

and the operation was performed and the wound dressed before she had fully gained consciousness. On making my evening visit, I was informed that my patient was not aware that she had undergone a severe surgical operation.

My second case occurred in the person of a little girl two and a half years old, brought to me for the purpose of having a supernumerary toe removed from each of its feet. While waiting for the arrival of Dr. Nelson, who assisted in the operation, the child fell asleep and was placed in the operating chair. As soon as the doctor arrived, chloroform was administered in the manner already detailed in the former case, and with equal succeess.

In the first case the condition of the child probably favoured the ready induction of anæsthesia, while in the second, age alone could be supposed to have influenced the result.—*Med. News and Libary.*

Influence of Fear in the Production of Disease.—Dr. O. Kohls. (*Berlin Klin. Wochenschr., Chicago Jour. Nervous and Mental Diseases*) records the following observations made by himself during the bombardment of Strasburg. A great variety of diseases were evidently either produced or greatly aggravated by sudden fright, from various causes, during the siege. Among affections of the central nervous system, he reports three cases of paralysis agitans, two women and one man, and three cases of spinal paralysis. He also saw affections of the genital system, suppression of the menses and abortions, and one case of angina pectoris, following the shock of sudden fright in a healthy person. Diseases of the respiratory apparatus were notably aggravated. The first appearance of hæmoptisis was often dated to sudden terror from the events of bombardment. Three cases of icterus catarrhalis were traced to the same cause. One case of affection of joints is given. The patient, hitherto a sound man, was, by the explosion of a shell near by, rendered speechless and trembling for several hours He immediately noticed a painful swelling of the hand and knee joints, with stiffness of the right index finger, which lasted for a considerable period.—*Detroit Review of Medicine and Pharmacy.*

The Position of Woman.—In all the situations and pursuits of life the Almighty has established bounds or limitations beyond which woman cannot go without defeating the primary objects of her creation. The reasons are obvious. It gradually changes her organization. By a physiological law of supply and demand, nature, in the case of woman, makes certain drafts monthly upon her constitution. That this law of periodicity be properly observed is indispensable for good health and the high-

est development both of the body and mind. Again, if the brain is reflectively exercised too much, the body suffers; so of the brain alone, there cannot be steady strain upon certain portions of it without impairing the functions of other parts. Maternity is primary law in her creation. Physiology, pathology, records of health. disease and mortality, establish the fact that this is her NORMAL state. In the observance of this law, certain physical conditions are indispensable; there must be a proper development of those portions of the body concerned in this function; neither can they answer the demands nature makes if kept constantly impoverished.—*Nathan Allen, M. D., LL D., Sanitarian.*

The Hours of Maximum Mortality in Acute and Chronic Diseases.—Dr. James Finlayson classifies the hours of death in a large number of well observed cases—both acute and chronic. In the latter he shows the greatest mortality to take place between the hours of eight and twelve A. M. In acute cases, the maximum mortality occurred between four and eight A. M. The next greatest was between four and eight P. M. The importance of these observations is evident. If it is desirable for a patient to live the greatest length of time, then especial vigilance will be observed during the above critical periods in using every means for recruiting the vital energies.—*Glasgow Med. Jour.*

Chlorate of Potash in Cancer.—Dr. von Burow, Sen. (*Berl. Klin. Wochenschrift*) has noticed that energetic local use of chlorate of potash would cause a shrinkage in ulcerating cancers; that resorption of neighboring infiltration took place; that the secretion was lessened, the sensitiveness reduced. A case of caries of the lower jaw, with extensive infiltration, and large crater-like swelling, was soon healed by the same treatment, the chlorate of potash powdered, and sprinkled on the ulcerations —*Rundschau.*

The Champion Chloroform Tippler.—Dr. W. W, Parker related, at the last meeting of the Virginia State Medical Society, the case of a man named Johnson, a blacksmith, who became addicted to chloroform tippling How much in quantity he swallowed is not stated, but he bought and drank three thousand dollars worth in three years! His mind then became affected and he imagined himself tricked. Meanwhile he fattened fifty pounds, and on ceasing the habit lived fifteen years in good health, and died from natural causes.

RUBBER.

(June 23d, 1874.)

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ARTICLE I.

Annual Address,

Delivered before the American Academy of Dental Science at its Seventh Annual Meeting, held in Boston, September 28th, 1874, by Dr. W. W. Allport, of Chicago, and published by vote of the Academy.

Mr. President and Fellows of the American Academy of Dental Science:

In an annual address, on an occasion like this, it would seem that remarks bearing upon the interests of our profession at large, rather than upon any particular question of practice, or science, would be appropriate.

The oft-recurring meetings of members of our profession, in different parts of our own country, as well as in Europe, at which papers are presented, evincing close observation and careful study upon modes of practice in the different departments of dental science; the multiplication of our text books and the well filled pages of our periodical literature our dental colleges, with many of their chairs filled with teachers qualified to instruct in medical colleges as

well as the high professional and scientific character maintained by many private practitioners, are, I think, sufficient evidence that there is not only an earnest desire, but a *determination* on the part of the better members of our profession for advancement and a correct application of dental science.

That within the last thirty or forty years rapid and substantial progress has been made in this direction, has been fully demonstrated in the experience of some of the older members of this Academy, as well as by those of like age and experience throughout our country.

But, because so much has been accomplished within this time, or during the present century, let us not be boastful; for, when we consider the changes and improvements that have been made in the science and practice of medicine, both general and special, in husbandry, in the arts, and in the sciences in general, there is not a little reason to question whether we, in our particular calling, have more than kept pace with the progress and developments in the other fields of science and labor around us.

Dentistry as a special art or department of science is it is often said, mainly, at least, of modern origin. It is an outgrowth, partly, of an increased ratio of disease in the teeth, though not so much, probably, as it is of a new demand of the advanced civilization and culture of the age. At an early day—far back in the past—when education and refinement were less general, teeth, undoubtedly, suffered decay and gave trouble, but less being known of the causes of disease and less of correct treatment, and less attention being paid to personal appearance, less importance was attached to the teeth than at the present time. But, as civilization advanced, and culture and refinement increased, health rose in estimation, cleanliness and personal appearance received more attention, and, as a consequence, defective and unsightly teeth became objects of greater concern, and dentistry, at first rude, came up and has grown to its present magnitude and perfection, to meet this new

demand of the times, just as the printing press, the telegraph and steam locomotion were first brought into existence with all the imperfections, and have, by ingenuity and skill, from tine to time, been improved to meet the demand created by the growth of business and desire for progress and information incident to the increase of population in our country and the spread of the civilization of the century.

When, therefore, we are persuaded to think that the improvements in dentistry have been greater, or that they have been made more rapidly than has been the general progress of the age, it will be well tor emember that teeth were filled when the printing press was but in its infancy, and that steamboats and railroads and telegraphs came into use long after artificial teeth were worn by George Washington, the first President of this, then experimental Republic. Then days and nights of most uncomfortable and weary travel were consumed in an overland journey from New York to Boston. Now, we sup and attend evening amusements in New York; then in flying palaces of rare woods and costly upholstery we retire to beds of luxury; and in the morning, with carefully made toilets, and with a *resume* of the news of the world, as a relish, we breakfast in Boston. Then, to have transported by land the amount of freight that is now carried from Boston to New York in a single train of cars, in a few hours, would have upset the labor and taxed the resources of all New England for months. Then, to have journeyed from Boston to where the city of Detroit now stands, would have been to bid farewell to friends and to place one's self beyond religious instruction or the watchful attentions of New England sheriffs. To-day, Chicago and even the Rocky mountains, are but convenient places for replenishing the lunch baskets or larder, of the thousands who every year, over mountains, through valleys and beside rivers, in Pullman's winged hotels, go rushing across a continent, composedly viewing prairie and lake, forest, fretting brooks, *sierra canyon*, and the silvered course of great rivers, and taking in, now and

then, a glimpse of a herd of wild buffalo, or camp and dance of wild aborigines. Hamlets and cities, the growth of a few months, are left behind in rapid succession, as on and on they rush to or from the golden State, the Atlantic or Pacific coast.

Could the wisest statesman, who lived at the commencement of the present century, be set down to-day in that great city of the West, once burned and twice built within the last forty years, and witness the passengers and freight passsing East and West over the great trunk roads centering there, he would surely think that this was not the world in which he once lived, and that the inhabitants of this strange land were changing ends with the continent, so altered and improved have all things become, so different the bulk and modes of travel and business.

Take whatever example we please, be it in agriculture, the arts of sciences, education, civil or religious freedom, the arts of war or those for promoting intercourse and preserving peace and thrift, the progress of the last seventy-five years has been greater than that of centuries before.

And only abreast with the advance of the age, have marched the improvements in the science and practice of dentistry, the surgical or operative department of which when rightly understood and practiced, has become a legitimate branch of medicine, requiring the same general knowledge of medical science, as does the practice of aural, *or* general surgery, or ophthalmology.

The same general laws of health and disease, pervade alike the most vital and the most remote and unimportant organs of the human body. To comprehend the laws that govern either the physiological or pathological condition of any particular organ or member of the body, how to preserve health, or intelligently treat any particular disease, be it either general or special, requires such a broad and special knowledge of the laws of health, and the nature and treatment of disease, as would qualify the special practitioner to diagnose and acceptably treat the ordinary forms of disease

met with by the family physician. Special knowledge of and unusual skill in the treatment of any particular form of disease, requires a general knowledge of the laws of formation, of growth, of the nature and results of different diseases, and of the treatment compatible with nature, that is best calculated to restore diseased parts to healthy action and conditions. Treatment upon the human organism, either general or special, resting upon any other foundation than this, is simply empirical.

We have heard much these many years about dentistry being a specialty in medicine, and that it ought to be so accredited by medical men; but if these views are correct, to what extent should dentistry, as it is generally practiced at the present day, be so regarded? And to what extent should dentists, as a class rank with surgeons, ophthalmologists, or aurists as legitimate specialists in medical practice?

In inquiring into this question, it will be proper to allude briefly to the past history, and the present condition and needs of the profession.

While history informs us that, as early as the days of Herodotus, dentistry was practiced, it is safe to say, that until a comparatively recent date, dental work of any kind was exceedingly rare, and the business was not followed as a distinct calling. The little that was done was confined mainly to the carving and setting of artificial teeth from wood, bone and ivory, possessing but little artistic taste or use. I make no new statement when I say that up to about the beginning of the present century, teeth were extracted by barbers and surgeons, and that artificial teeth were carved and set by jewelers and silversmiths only. Although teeth were then occasionally filled, the construction of a set of artificial teeth was regarded as the *ne plus ultra* of dental skill. At the same time this was looked upon simply as evidence of that peculiar mechanical ingenuity which enabled the artisan to turn his hand to an odd job outside of the regular routine of his trade. Dentistry was then merely mechanical; comparatively nothing being known,

either of dental histology, physiology, pathology or therapeutics.

Experience having demonstrated that fillings, though imperfect, would arrest decay in teeth, the demand for these operations increased ; but up to this time they seemed to be empirical, the science of their beneficial effects not being understood. But as the period of the higher mission of dentistry—the saving of natural teeth—approached, Hunter, Blake, Fox and other medical men began to study more closely their structure, their physiological and pathological conditions, and their relations to the general system. Then followed the therapeutics of filling, and the science becoming better understood, a demand for better and more frequent operations upon the natural teeth arose, and for the purpose of making artificial teeth and the treatment of natural ones, a co-partnership between medical science and a mechanical art was entered into and conducted under the firm name of "dentistry."

Under this new condition of things, dentistry began to have a literature, and its practice was espoused by men of higher culture, to whom it offered a field for the exercise of more varied talents as well as one of greater usefulness. In a few years such men as Greenwood, Hudson, Hayden, Parmly, Flagg, Harris, Townsend, Clute, Westcott and Badger were found engaged in practice. The science and practice of dentistry, in its various departments, were pushed forward with great rapidity, and schools were formed, in which was given such medical and mechanical instruction as was thought necessary to qualify the student for practice in accordance with the standard sought to be established by such men as I have named, and with a view to making it a specialty in medicine.

Dentistry, thus given over to a special class of practitioners, has conquered its way, by its inherent importance to the welfare of man, up to the high position—taking its ablest representatives for the criterion—it now occupies, and in this growth, it has approached nearer and nearer to its nor-

mal status and true mission, an integral part of the science and art of medicine.

In bringing about this result, whereby our practice has been settled upon a more scientific and practical basis, and a wider range and better class of operations brought into vogue, our dental colleges have been greatly instrumental. The complaint, however, is frequently made, and not altogether without grounds, that the standard actual, for graduation, in these colleges, is much below their standard as formulated; and that diplomas have, in many instances, been conferred upon persons unworthy to receive them. Still I believe it would be unjust to say that the actual standard has not been fully up to the demand, either of the profession or the public. In fact, I believe our schools have been more anxious to graduate first-class practitioners than a large majority of the public have been willing to encourage and pay for first-class skill.

I am aware that it is said the demand of the age is for better dentists and better dentistry. I do not deny that there is *need* of a better class of dentists, but, at the same time, I believe that the average skill of the graduates of our colleges is really up to the demand of the general public. Let it not be inferred, by these remarks, that I wish, or intend to sanction, or apologize, for the shortcomings of our colleges, in graduating those whom they know to be unfitted for practice and unworthy of the honor conferred upon them. I merely state what I regard to be a fact; they supply, not the *need*, but the actual demand of the public, in the productions which they send forth. The principal is not unlike the inexorable laws of supply and demand in trade. The people usually get what they appreciate and demand, whether it be in commerce, manufacture, education, or professional services. Let those, therefore, who desire to see our schools more exacting, as to the qualifications of their graduates, see to it, that, not only by a correct example in practice on their own part, but also, by a systematic, and correct course of popular dental instruction, in

public prints, journals and otherwise, the people are taught the importance of saving their natural teeth, and the difference between correct practice and quackery. Then, too, it will be well, for some of those, who find so much fault with our dental colleges, to take care that there be such an elimination of students, that those only who have a sufficient amount of brains, and other requisite qualifications, to make good practitioners, be encouraged to enter the practice, and that such private instruction be imparted to them as shall qualify them to receive the greatest benefit from a high grade of teaching in our colleges, or else cease their fault-finding.

I do not wish to exonerate our schools from the just blame that should be attached to them; but, let it be remembered, that the sin of omission, on the part of the profession, is quite as great as the sin of commission, on the part of our colleges. "Let him that is without sin cast the first stone."

While no one can question that amongst the educated and better classes of people, there is an increasing demand for higher skill in saving the natural teeth, no careful observer can have failed to notice the fact, that within the last fifteen years, there has been an increasing demand for cheap sets of artificial teeth. The result of this is, that the better class of men entering the profession are devoting their time, almost exclusively, to operative dentistry, in the service of patients who really appreciate skill; while the interior men are turning their attention to low-priced mechanical Dentistry, and to inferior operations, filling teeth for such people as neither appreciate, nor are willing to pay for saving operations on the natural teeth.

That mechanical dentistry should have very largely fallen into the hands of this inferior class of practitioners will hardly be wondered at by those who have watched the history of that branch of the practice. Up to about twenty years ago the mechanical department of the practice required a practical knowledge of selecting and compounding the

materials out of which the teeth were made; the hand and the eye of an artist were requisite to give them form and color; the management of heat in baking them; a knowledge of the nature of the precious metals and skill in working them, and a high order of mechanical talents in applying intricate mechanical laws in fitting and rendering useful the different forms of plates, together with mechanical and artistic skill in so adjusting the substitutes as to subserve the purposes for which they were intended. Since then, the manufacture of artificial teeth has become a distinct business, and they are now simply articles of commerce, bought by the piece, set or thousand; and to such perfection has this branch of manufacture been carried that few dentists now think of making the teeth that they use. Plates of precious metal, requiring mechanical skill of a high order to manipulate, have, in a large majority of cases, been substituted by plates cast from baser metals, or by rubber vulcanized in moulds, these requiring neither a high degree of judgment nor mechanical skill to accomplish results tolerably well, limited by the properties of the material used.

As a consequence, therefore, of these conditions, the surgical branch of dentistry, which, when practiced by competent men, allies it to medical science, has been constantly on the advance, while that which is devoted to the setting of artificial teeth, has, in the last few years, been steadily retrograding and becoming more and more a trade. And so simple are the modes of attaining tolerable mechanical results, with the methods now usually employed in this department, that a high order of appropriate talent is, at the present time, seldom found devoting much time to it. By this I would not be understood as saying that this latter department does not need improving; for, when viewed as an art—he who has but moderate ideas of symmetry or harmony of expression and color is constantly pained by the lack of that artistic selection and arrangement of artificial teeth, which serves to restore to the face the shape and ex-

pression left upon it by the Creator—the absence of which, in artificial dentures, stamps him who should be an artist, an *artisan*—a mere mechanic—a libeller of the soul—a deformer of the human face, Divine.

At the present time there are about 12,000 practicing dentists in the United States, about 2,000 of whom are regular, or honorary graduates of either dental or medical schools. To offset the unworthy graduates by those practitioners, not graduates, who, by study and exertion have earned a deserved reputation and position in practice, would, I think, form a fair estimate of the really competent practitioners of scientific dentistry in the United States at the present day ; making the number of the really qualified about one-sixth of the entire number. Assuming, therefore that the one-sixth, as are the members of your Academy, sufficiently advanced in the knowledge of medical science to entitle them to the right to be regarded as special practitioners of medicine, it can hardly be expected that dentistry, as a profession, when taken as a whole, would, or ought to be so regarded by medical men.

This claim, while being justly made by some, and freely acknowledged as to a portion of dental practitioners, individually, has, not without cause, I think, been denied to the profession at large. The tastes, habits and acquirements of the two classes of dental practitioners are as divergent as are the characters of true science and mechanism ; the practice of the one being established upon a medical basis, while the other relates only to a mechanical art. The practice of either branch, it is true, involves a limited knowledge of the other, but it is not necessary either for the surgical practitioner to be a practical mechanic, or the mechanician upon artificial work, to understand the rationale of medical treatment, or to be an operator. In fact, the practice of both, by the same individual, prevents the highest development of either, as would the time spent in the manufacture of artificial legs by the surgeon, or the compounding, baking and coloring of artificial eyes by the

ophthalmologist, serve but to retard the higher development of their specialties, or an attempt by the maker of limbs, eyes, or optical instruments to practice general surgery, or the treatment of the eye, but degrade his own proper art.

As I have before stated, the yoking together of the two callings seemed to be a necessity of the then condition of the practice, at the time they were joined, and has resulted in great good. But the development of the practice has now brought us to a point where it is clear a new departure should be taken, the copartnership dissolved, and each department followed as a distinct and separate calling, both no longer, either in private offices, or in our colleges, be taught as *one*, and the term "dentist" dropped from our nomenclature.

The true mission of medical science is to preserve or restore health and save life and limb, not to make or have to do with the making of artificial substitutes any further than as they shall be made directly useful in subserving these purposes. Wig-making and the manufacture of artificial limbs and eyes, are useful and respectable callings, and when properly pursued, require a good degree not only of mechanical skill, but also of artistic taste ; and as well almost might the making of these be taught in the medical college, as the making of sets of artificial teeth form part of the curriculum in a medical specialty. The long association of operative with mechanical dentistry, will make it somewhat more difficult, at first, to disconnect them in the minds of the public, than in practice, as separate calling ; but no professional act would be so directly instrumental in accomplishing this result, as to drop mechanical dentistry from the curriculum of our colleges, and employ the time usually devoted to the teaching and practical work in the manufacturing of artificial teeth, (a knowledge of and skill in which, is of no practical use in private practice, at the present day,) to metallurgy, to mounting artificial teeth, and to other laboratory-work, and giving broader and more comprehensive instruction in the science of medicine in these schools, or

else, to incorporate them with the regular colleges of medicine, by the establishment of appropriate chairs and infirmaries for clinical teaching.

Let dental mechanics be otherwise taught, as a high mechanical art, and the calling fixed in the mind of the public as such, and, in a few years, a patient would as soon go to the maker of artificial legs for advice or treatment, in conservative surgery, or regarding amputation, as to the *dentician* or *dentificier*, for advice or services in the saving of his natural teeth, or their extraction.

To drop the teaching of mechanical dentistry in private offices and in our colleges, would, in a few years, permanently divide the practice, and very soon each town of any considerable size would have one or more of these practitioners who, by relying entirely upon success in this calling for support, and becoming personally responsible for what they did, would seek to redeem and elevate their particular art to the highest degree attainable, thereby enhancing the respectability and usefulness of their calling. And the *dentologist* would, by the broad and comprehensive teachings of medicine, become more thoroughly grounded in its science and be better qualified to take his rank with the other medically recognized specialists. With this thorough groundwork laid, he would not only be better prepared to treat from a medical standpoint the diseases belonging to his province, but also to grapple successfully, by general treatment, with those hidden and hitherto ill understood influences which serve to prevent perfect dental development, and also to counteract those pathological conditions which act as causes of disease in the teeth and tend to break down their tissues.

With the development of this higher mission of our profession there will be no occasion for the spectacle of dentology, with the grimace and shuffle of the mendicant, approaching the gates of the medical profession, and with downcast eyes begging a crumb of recognition. But with the accomplished separation of the two callings, heretofore

combined in our practice, dentology enriched by the experience and the special literature of the last half century, and the foundation of its practice laid exclusively in the science of medicine, rather than divided between that and a trade, the incongruity of the past will in a few years, disappear, and by deriving its nourishment from the body of which it is a branch, it will become more and still more assimilated to the science and the practice of medicine, and without demand, or the asking, there will, both by the public and the medical faculty, be accorded, not to individual practitioners, but to the branch, a full and cordial recognition as a specialty in medicine, which will attract more generally to its ranks, as to an agreeable and useful field of labor, men of earnestness, ability and culture, the peers of any in an honorable profession.

ARTICLE II.

Report of the Committee on Mechanical Dentistry,

To the Southern Dental Association, 1874.

No very striking or important invention has been developed in Mechanical Dentistry during the past year. But while so many advances are being instituted and startling developments made in the operative department, your Committee does not think that the fact of their having nothing specially new to report, should excite concern. Not that the question has lost its interest, or that Mechanical Dentistry is losing its importance, but it is thought that what we most need is not something more available, so much as that a better use be made of what we are already possessed of. The eager cry, etc., restless search for the new and novel, for something of easy manipulation is to be deprecated as injurious to that patient culture from which alone can result those productions of art which are at once our admiration and our despair.

Good, honest, faithful work is the great necessity of the hour. What the profession most needs at this time, is men

who are not afraid to extend the same amount of labor of body and brain on replacement that they are willing to give to the natural organs. Banished as this department of our practice is to an out of the way room, and given in charge of a subordinate whose only ideas on such subjects are such as he has picked up from hurried instructions, imparted while handing him an impression and shade tooth ; it is not to be wondered at, that our work in this line has fallen in our own esteem, and is slightly valued by those for whom it is executed ?

We should endeavor to restore the Laboratory to something of its former dignity ; its full and original importance it may never have, and it is well perhaps that it is so. The advances of art in Operative Dentistry, forbid the wholesale loss of teeth that formerly occurred. But in the effort at accomplishing so much in the way of saving the natural organs, have we not lost sight of the many for whom we have extended our best efforts? We have only postponed the evil day.

The manufacturers of teeth evidently have not forgotten these, but have kept pace with the demands of the times. But is it fair for us to be led by those outside of our profession? Is it not a reflection on ourselves that men who have no such lively interest in this question as we, should be the suggestors of ideas and forms of beauty, such as we only idly dream of?

No; we want honest workers in the Laboratory. The reaction which we have so sadly needed has, we think, evidently begun, and good solid gold and other substantial metallic plates are reasserting their right to a place in the mouth, while the cheap and horrid vulcanite is passing away. Having had its day, it is time! Emblem in worth of the knavery which has fattened on it and of the stupidity and ignorance which has manipulated it, it is to be hoped that this base is at least taking its proper place in the list of materials for dental plates—at the bottom.

But while this reaction is going on, it were well if it could extend still further. This whole curse of cheap work

has only to be ventilated to show its hollowness and want of truth. The dentist who bargains for gold plate fit to wear and makes it half alloy, needs converting to a purer faith, a holier practice. The man who allows himself to be persuaded into buying cheap teeth because they are just as good if not better than those that cost three times as much, (or at least the sellers say so;) the one who will persuade his patient into wearing a rubber set, saying it is just as good if not better than gold, etc., all this to save a few cents and and a little trouble, or perhaps to save the mortification of acknowledging that he does not know how to work gold—such need converting.

Cannot the "best men in the profession," who "have been driven from the Laboratory in disgust," come forth and show that there is a better way than this present and past? Their patients heed them on other subjects, and are wary of the men who will fill their teeth at half price,—will they not heed them also in this?

Your Committee would repeat that the need of the hour is better men in the Laboratory. The times demand it, our patients need it, and we should not be slow to show them that they do. So long as there are hundreds who never made any other than a rubber plate, and, while we may count on our fingers almost the good plate workers, it is surely time for reform. We talk of educating our patients in other things, we carefully instil into their minds the superiority of gold over amalgam,—the same teaching in this department, as carefully performed, should produce gratifying results.

Of the rubber litigation, etc., its results your Committee deem it scarcely worth while to comment on, except in so far as it furnishes additional arguments in favor of a higher standard of work than at present exists. If this controversy shall result in compelling the more general disuse of vulcanite, (a result by no means intended or anticipated by either party, and yet a most manifest result,) a substantial good will have been wrought.

It is to be hoped that the enterprise of those who have been so industriously seeking substitutes for vulcanite, is now crowned with success; a double good may thus be secured—escape from an annoying monopoly and the substitution of a better article. To those who do work vulcanite, however, it may be worth while to call attention to the methods of manipulating this material as introduced by Messrs. Stuck & Owens, some six years ago, the method bring briefly the hardening of the plate between sheets of tin. This method unquestionably has advantages over the ordinary style of vulcanizing, in bringing more clearly and in saving of time, and resulting in many cases in a better fit from the shrinkage of the metallic die on which the plate is hardened. It is worthy of the thoughtful experimentation of all who are interested in the subject.

The rise and progress of the celluloid base has been watched with absorbing interest by the profession at large, not so much as a means of escape from the vexatious Rubber question, as being the dawn of a hope of something better. This hope seems to have brightened into a substantial reality. The many experiments made by careful men have apparently favorably settled beyond all reasonable doubt some of the questions upon which the fate of this base seemed to hang. It does now seem demonstrated that with careful mangement it does not shrink or warp perceptibly, and the question of its durability also seems in a fair way of being favorably decided. All other things being equal it is esteemed by many as a better base than rubber, in that it is above the suspicion of mercural taint. But the dentist who expects to give it the slovenly manipulation he may bestow upon vulcanite with the expectation of a good result, will be disappointed, for the carelessness that may give a passable result in the one, will most probably result in the failure of the other. And in this feature of greater difficulty of manipulation, your committee see substantial merits.

Of the varieties of this collodion base, but two are prominently before the public, the so-called Celluloid and

the Rose Pearl of Dr. McClelland. With the first it is suggested that when practicable, a metallic die or model will give more satisfactory results, avoiding the damage of breaking the plaster model. With the Rose Pearl much greater difficulties are present, owing to the hardness of the material, but the results are apparently excellent, plates moulded for months showing no signs of warping or shrinking. Some carefully conducted tests compel your committee to the belief that with careful manipulation excellent results may be derived from either of these varieties of the collodion base. It is hardly fair however to decide upon the merits of such a thing, upon the issue of a single trial, as some seem to have done, however confident we may be of our skill. But your committee would earnestly urge upon the members of this association a patient trial of one or both of these bases, not resting satisfied with a single failure.

SELECTED ARTICLES.

ARTICLE III.

American Dental Association.

FIRST DAY.—*Morning Session.*

The fourteenth annual session of the American Dental Association convened in St. Andrew's Hall, Detroit, Michigan, on Tuesday, Aug. 4th, 1874; the president Dr. T. L. Buckingham, of Philadelphia, in the chair.

The exercises were opened with prayer by Rev. Mr. Mercer.

After the usual preliminaries of calling roll and reading the minutes, an amendment to the by-laws, lying over from last year, was taken up and adopted, which makes membership to consist of three classes instead of two as heretofore; the class of honorary membership being added to the two heretofore existing.

An amendment to the Code of Ethics was also adopted unanimously, which qualifies the clause in reference to advertising and cards, so as not to condemn the issuing of cards containing a fee-bill for services.

Afternoon Session.

A motion was made to hereafter refuse admittance as delegates to any person who might be in arrears for dues; which gave rise to discussion but which was finally carried.

Reports of Committees were then declared in order; and that on Dental Physiology being called, Dr. Dean, chairman, submitted a report, of which we give a synopsis, published in the DENTAL COSMOS in 1860, in relation to the phenomena attending the absorption of the deciduous teeth. (This paper was read by Prof. McQuillen at the request of the association, and we give here, for the sake of convenience, a brief synopsis of its contents, although it was read immediately following the report of Dr. Dean.)

Dr. McQuillen's paper first reviewed the various theories which had been propounded from the earliest times down to that date, and pronounced them vague and unsatisfactory. It then directed attention to the fact that the teeth must not be viewed as isolated organs, but as integral portions of the entire economy, and subject to the same influences that control the function of nutrition in other portions of the organism; that from the first both composition and decomposition of all the tissues is constantly taking place,—varying as to rapidity in the different tissues and at different ages. Various proofs of this, as regards the bones, were referred to. As in the development and formation of the various tissues the primary active agents are cells previously

existing in a structure less fluid, called blastema, so in nutrition the end is attained by or with the continued energy of cells. Each cell is an independent organ, having a definite period of existence, and in them every organ has in itself the elements of construction and destruction. Therefore the agency of an acrid substance, or of a carneous body, which had been supposed to be necessary to the absorption of the roots, is not demanded; retrograde metamorphosis or molecular disintegration fully accounting for it. The dental tissues are but a congeries of cells, constituting an animal matrix, in which the calcareous salts are deposited. As the animal matrix degenerates, cell by cell, the calcareous contents are liberated, and become mixed with the fluids, to be taken up by the venous or lymphatic radicals. In a normal state waste and repair are balanced; when they are not, either hypertophy or atrophy results. The absorption of the roots of the temporary teeth is but an instance of atrophy of the dental tissues. For a brief season repair is equal to waste, and no change takes place; but eventually disintegration supervenes, and the roots are absorbed and the tooth falls out. It is reasonable to infer that the action is connected with the development of the permanent, for no instances are on record where it has occurred without the deciduous tooth being followed by its successor. The germ of the permanent tooth occupies a position in close proximity to the roots of the deciduous tooth, where it remains for some time in a state of dormant vitality, or at least with no increase of size; but eventually a new life springs up in the permanent germ, it draws from the blood the materials inservient to iis development and growth, and in so doing removes from the current flowing to it and to the deciduous tooth, through arterial twigs from the same vessel, the constituents necessary to repair the waste that takes place in the latter. In many instances the supply is equal to the demand of the permanent and deciduous organs, and under such circumstances the development and eruption of the former takes place, with little or no absorption of the latter

In addition, as the permanent papillæ increase in size, and the crown of the tooth is formed, the vascular structure surrounding it makes a graduated pressure, first on the capillary vessels of the osseous partition, and then on those of the deciduous tooth, thereby arresting or diminishing the flow of blood distributed to those tissues. By these two causes not only the *quality* but the *quantity* of blood sent to the deciduous tooth is modified, and the absorption is favored. Of the effects of a graduated and continuous pressure in producing absorption of bone, the atrophied condition of the body of a vertebra that has been subjected to the pressure of an aneurism may be cited. In such case the pressure upon the capillaries of the periosteum does not cut off the blood entirely, (which if occuring, would induce *necrosis,*) but merely diminishes the current, so that the supply is not equal to the waste, and atrophy is the result. The influence of the sympathetic nerve must not be lost sight of, as nutrition is more or less dependent on this connection.

Dr. Dean's report proceeded to examine the foregoing author's more immediate cause of absorption, viz., atrophy; stating that it involved objections which to his mind were irreconcilable with established facts; it was stated that if supply and waste were constantly going on, the channel by which it was carried on was the apical foramen; if absorption results from privation or nutritive material, it must be *all* the tissues nourished by the source of supply, and commence in the interior, and would take place uniformly throughout the dentine; which is not the case. Absorption commences and continues externally, and the interior retains its integrity for a long time. If we admit that pressure may cause atrophy, it cannot be claimed that the portion of dentine pressed upon has been deprived of nutriment. We sometimes find absorption or atrophy in the roots of the teeth of aged persons, which it cannot be maintained is due to want of nutrition, since the interior cavity has at the same time been obliterated, showing an excess of nutrient supply. It is rather due to an abnormal action of the root-membrane,

differing entirely from the process of removal of the temporary teeth.

If this absorption is the result of deficiency of nutrition, why are not pulpless milk-teeth removed more rapidly than others? The supply is entirely cut off, and the waste should increase in proportion. The facts are quite the contrary, and are antagonistic to the theory of atrophy.

It is apparently considered, by the author spoken of that the cells of dentine retain their individuality; it is so held by others. But to me seems that dentine is not made *up of* cells, but *out of* cells. Tomes, Beale, Waldeyer, and others support this view. The cells have metamorphosed, and the dentine is the product. The author agains says that the cells have a definite period of existence. It seems to me that that period is dependent on circumstances and conditions which are variable. Matured dentine is not disintegrated unless surrounded by morbid tissues, or from mechanical, —even if its nutrient supply is entirely cut off. Teeth pulpless for twenty-five years are matters of common observation.

Some claim that the dentine of pulpless teeth is sensitive, or at least vital. If so, whence is the nutrient supply? Can it be from any other source than the same cells from which it was derived—ostoklasts converted into germinal matter? If we say no, where are these agencies in the pulpless tooth? Dr. McQuillen himself says that the particles newly added must impart their own vital properties, and the principle I have just stated was derived from Beale, who says that all formed material passes through the condition of germinal matter.

The report then called attention to facts in connection with the accepted theories in regard to the immediate agents causing absorption. Physiologists agree that these teeth are removed directly by the agency of an absorbent papilla, though a difference exists as to the origin of this body and its mode of action. Tomes describes it as applied closely to the wasting surface of the tooth, the indentations of the latter being occupied by the large cells of the body. Kehrer

believes that the amœboid cells mine away the tooth by long finger-like processes. Kolliker attributes it to "giant cells," which occupy the lacunæ or pits observed in absorption, and which are organs which destroy the dentine. These are the recent expressions of Kolliker.

The subject being open for discussion,

Dr. Atkinson congratulated Dr. McQuillen on his efforts to correlate the best authorities then known, but then or now, it will not do for us to talk of functions and stop at cells. Molecular metamorphosis is an unfortunate term, because it is not only molecular metamorphosis, but it is granular metamorphosis, and that is what breaks down cells. Molecular metamorphosis changes the fluid protoplasmic mass under the law of the activity of special combinations of affinity. Until we get right upon our knees and investigate the very territories of the activities we are speaking about, we shall never do more than pronounce mouthfuls of incongruous apprehensions. What is absorption? Simply bringing back to a fluid again what was fluid before; and it might as well be done by a carneous body as anything else if we were beginning *de novo*, but we are not; we are under lay, and investigating operations in bodies capable of being seen and misinterpreted. It is no reason why because we cannot go to the very origin of modes of motion down to final causation, we should not go any of the way. What do you mean by metamorphosis and the germ of cell-life? We shall never know till we go back to atoms, and understand how they become satisfied in bonds of affinity, forming molecules, and molecules granules, and granules cells, and cells tissues, and tissues organs, and organs system. We must go back and know how cells generate. There are thirteen kinds of atoms in the body, and because of their changes of relation they present us with molecules, and it is because of their endowment of power that we get any functional activity. When oxygen and hydrogen are brought together in that relation by which their affinities can express themselves they become water, and the smallest speck of

water is a molecule and not an atom. We cannot see an atom or a molecule as such. When they grow to granules we begin to differentiate them. The law of the bonds of affinity being satisfied, we get healthy tissues or organs. Solution is before absorption always; why not say solution? We do not understand why some teeth should develop to a certain extent and then stop, while others develop completely still leaving the roots of the temporary teeth complete. We have been dealing with the machinery and implements of function. Who can say when there are enough cells deposited to complete tissue? Only the master-builder,—the little typal presence that says that four fingers and a thumb are enough. We must resolve ourselves into both physicists and spiritists before we can get at the truth. When we understand dynamic atoms we can go on and talk of function. We have positive neural blood set off against the negative vascular blood. If we near what causation is, we shall understand what kind of food ministers to each kind of molecule. I would advise any student of microscopy never to read Schwann and others, for they will be stumbling-blocks in the way. Read the book of nature for yourselves.

Dr. Knapp. The writer of the report (Dr. Dean) omitted to mention the fact put forth by Tomes, and verified by observation, that there is no absorption in the root of a deciduous tooth after the death of the pulp. It is no proof, because we find such teeth partially absorbed, that the absorption did not take place before devitalization.

Dr. Judd. Absorption as now used means not only sucking up, but a breaking-down process of the hard tissues. Atrophy and absorption are entirely different processes. Atrophy is a molecular disintegration not recuperated by progressive metamorphosis. The process of nutrition arrested, while the retrogressive process still goes on. In absorption we have as it were a cutting away of the whole root, not a shrinking down of the root, as in soft tissues that are atrophied. Dr. McQuillen asks whether there is any carneous body found in absorption of ordinary bony tissues.

If I understand Kolliker, he claimed that in all cases of true absorption these ostoklasts are found veritable carneous bodies. It is not however, a mass of cells, as in the absorption of the deciduous teeth. If this be true it is a considerable advance upon our previous theories, though it does not explain everything. The origin of these "giant cells" we have not been able to detirmine. We often find that when we tear away the veil that covers up one thing, we reveal still further mysteries.

Dr. Atkinson. We must observe whether the ostoklasts are before or after absorption. Results are taken for causes nine times out of ten. We should not commit ourselves by saying these are forerunners of the breaking down.

Dr. McQuillen. Dr. Atkinson's exceptions are well taken when he asks, with regard to the ostoklasts, odontoklasts, giant cells, amœboid cells with finger-like processes, etc., said to tear away bone and tooth structure. Do they precede or follow absorption?. It is reasonable to infer that the latter is the case, and that they are only the osteoblasts and odontoblasts freed of their calcareous constituents. It is one thing to theorize, and another to examine the operations of nature; and although nutrition is not an object of microscopical observation, for in the effort to observe the process is stopped, yet much can be learned by examining the arrangement of the cells in ossifying cartilage and in the pulp of the tooth of the calf; preparations of which will be shown, under the microscope, to any of the members present who desire to see them. The osteoblasts of bone and the odontoblasts of dentine are but modified cells. The odontoblasts are elongated cells, arranged side by side at the periphery of the pulp, and constituting the "*Membrana eboris*." Kolliker's theory is, that the odontoblasts secrete a gelatinous substance that eventually becomes by calcification the intertubular structure, while the odontoblasts are converted into the sheaths of Newman and the fibrils of Tomes. According to Beale the outer portions of the odontoblasts assume a gelatinous structure, which undergoes

calcification, while the central part remains soft (the fibrils of Tomes,) and the intermediate portion constitutes the walls of the dentinal tubuli or sheaths of Newman.

Dr. Judd. The meaning of "cell" is much changed from what it was twenty years ago. It is a nucleus surrounded by protoplasm; the primitive element from which tissues are formed. There is no necessity for walls; it is a living being without walls.

Subject passed. Adjourned.

Evening Session.

Minutes read and approved.

The same subject under discussion.

Dr. Atkinson said that he regarded the carneous body as a result and not a cause of absorption; it is a first-class scar tissue. The pulp can die and leave the carneous body alive. Any body that becomes foreign must either be thrown out or encysted; it cannot remain to go into decomposition. Death of the pulp produces decomposition. We call a pulp the nerve, but we might as well call the gum nerve. The circulation is the same, the nerve is the same, and there is also connective tissue.

Prof. Judd. Some facts must not be lost sight of. It is theoretical about there being a less amount of circulation. Suppose we arrest the circulation and take out the pulp, do we have absorption going on? Never. Then it is no want of nutritious material, no atrophy.

Dr. Atkinson. There is serecoid aneurism under the cap of dentine,—proud flesh in other words. It is not the approaching tooth; never knew such a case.

Dr. Judd inquires how Dr. Atkinson accounts for the carneous body. Why are the cells larger, so that they are called giant cells? Facts ought to harmonize.

Dr. Atkinson. Small soap-bubbles break into larger ones; the distinction is perfectly clear.

Dr. Dean. The absorption of ivory pegs in living bone proceeds the same as in the bone; it is, therefore, no loss of nutrition.

Dr. Taft. Is the carneous body the pulp of the temporary tooth in a changed condition?

Dr. Atkinson. They are similar, but not the same. This body never exist after the death of the pulp.

Dr. Taft. There is a difficulty; the root is often removed when the pulp is not invaded. His impression is that the removal is effected by the carneous body; what that body is matters not, the root is desolved and removed like other debris. To be taken up, it must be a solution, and the solvent can come from nowhere but from this body; there is no privation of nutrition. The character and function of the dentine remain.

Dr. Atkinson. This is simply assertion. How does a ripe pear drop? We cannot understand it, but can appreciate it, as we do that ten times ten is one hundred. No one can understand for another.

Dr. Knapp. An important tissue has received no attention,—the perosteum. This membrane undergoes a change, on the approach of the permanent tooth it becomes thickened. This had to do with building up, and why not with the tearing down?

Dr. Palmer. When silver is placed in the battery by the platen, there is no absorption till the current passes, and then the material is placed upon the other pole. The life is the chemical affinity; it has power to know how much to take away.

Dr. McQuillen. It is a well-recognized fact that the process of absorption is arrested with death of the pulp of a deciduous tooth. He could not comprehend the distinction that had been made here between atrophy and absorption, believing, as he did, that in nutrition as in other operations "nature acts not by partial but by general laws." Great stress has been laid upon the part that the giant cells perform in breaking down osseous and dental structures, but it was difficult to understand how one tissue could tear down another.

The subject was then passed.

The report of the Committee on Pathology and Surgery was next called for, and Dr. Cushing read a report written by Prof. Chase, of St. Louis.

Dr. Chase's paper was entitled, "Some Observations on Diseases of the Enamel." It stated that the enamel was subject at an early period to inflammation; and, even later, to some of the movements which resulted in inflammation and death. The permanent teeth, during their development, are injuriously affected by various skin-diseases,—small-pox, measles, scarlet fever, etc,—which leave a certain impress upon their structure. The enamel sheath partakes in the inflammation, and every prism is affected. Cell-life is now most active, and building is going on: but if the workmen are sick, or if there are no materials, progress is arrested. Absorption, however, goes on, and the result is pits or grooves, which shows after eruption. White, chalk-like spots are caused by inflammation of a small number of enamel cells before crystallization, resulting in stasis of the lime salts. Seedy or granula enamel is caused by inflammation at a later period. There is, in healthy enamel, a free circulation of blood plasma, through osmotic action. As age increases, the activity of nutrition diminishes. The dental tissues are in state of mobility up to, and, the writer believes, long after the fifteenth year. The enamel has not then that vitreous appearance which it has later. The interior parts of it are not as hard as the outer, since it begins to harden at the exterior, which is always in the advance. It is demonstrated that absorption takes place in the dentine, and, in rare cases, in the enamel. As we have seen, inflammation before eruption causes necrosis of the enamel; and the same result may be produced after eruption, by pressure of an adjoining tooth, causing arrest of circulation and stasis in the enamel; the tooth at fifteen years presents a whitish spot without polish, and cutting like rock-salt. At twenty the spot is brown, and vitreous on the surface, but soft underneath, and the dentine is softer than natural. At twenty-eight the spot is black, but hard and vitreous shading off in

color and density until the dentine is reached. This is not caries, but a case of arrested circulation. Spontaneous abrasion can only be explained by a theory of vital action like this; and the literature of the subject shows cases on record confirming its truth, and even of united fracture of the enamel.

The subject being open for discussion,

Dr. Atkinson said that the paper was full of statements which were purely gratuitous, though they may be truths: the heavenly court may have illuminated the writer. If he asserts that enamel calcifies toward the interior, he is at fault; for it calcifies at the periphery. The report said the enamel was a dermal production, and he is sorry for him and for the world that they don't get along any better than that. Enamel is hypodermal,—dentine is dermal. Objects to the statement that it can be inflamed; it is a good stretch to suppose that dentine can be; all the change which takes place in enamel is increase in density. Many immorally attribute effects to the hydra-headed monster syphillis which may be produced by scarlet fever and other diseases.

Prof. Judd. It is incorrect to suppose that inflammation takes place in the enamel, and it is probable that the paper has been misunderstood in reference to the manner in which enamel calcifies: objects to statements being made dogmatically because the writer thinks so; claiming circulation in the enamel is going further than most physicians would go. Circulation is not the proper word. The enamel may be permeated as marble is by water; setting teeth on edge is an effect of this. There is some kind of nutritious change, but it is small and slow; but no vital changes sufficient to bring about true inflammation. Would not say that nerve fibrillæ did not permeate the enamel. It was for a long time supposed that they did not permeate the muscular sheath; but it is now known that they do, also the epidermis. These fibers extend farther than we suppose. The sensitiveness of enamel to acids may be accounted for in this way. There is a great difference between caries and abrasion; it is

probable (but not stated for fact) that the shaping and direction of carious cavities are due to the action of para. sites; in abrasion the tubes are filled up, and no opportunity is afforded for them to gain a foothold. No experiments have produced caries without parasites, They cannot be accounted for by acid.

Dr. Bogue. If the pulp were really nerve, as it is called, there could be no such pain as *tic-douloureux*, since this is from engorgement of the circulatory vessel. The first stage of toothache is irritation, and its result sensitiveness; it is caused by decay, while abrasion is caused by the recession of the alveoli. The second stage is inflammation,—pulp nearly or quite exposed. Pressure, etc., produce acute pain, until strangulation takes place. The first stage may be relieved by filling; in the second, if we could prick the pulp and draw a drop or two of blood, it would give relief. Self-cure is the death of the pulp; putrefactive disintegration and injection of gases through the foramen follow. This is the proper condition to produce abscess. When devitalized teeth are opened and the sporadic germs in the air come in contact with the pulp, abscess is apt to be formed.

Dr. Hunter inquired whether, in perfectly-formed enamel, acids can permeate and set the teeth on edge.

Dr. Judd thought certain fluids might permeate from the outside even when perfect.

Dr. Atkinson. It is always permeated. Specimens crack when dried. Protoplasm is neural mass, or granular matter, or what you please, and removal of some of its elements sets it on edge; a soapy or alkaline wash cures it instantly. Doubts whether any microscopic spore can enter even the tubules. Chemical action must be endowed with a mode of power which we denominate vital. When we say crystallography is want of life, we have proven our non-survey of the whole field. Wherever action is, vitality must be.

Dr. Butler. We can demonstrate that the enamel is permeated from without. When the dam has been applied it becomes whitened, and when wet returns to its former condition.

Dr. Morgan. It will be questioned that the enamel is a vital structure; if so, it must be subject to the same laws that govern other parts of the body; animal may be removed and restored. There is no sensibilty, so far as he knows, in enamel; when teeth are "on edge," the enamel is not perfect. In some specimens the tubuli penetrate into and perhaps through the enamel. In these cases you may have sensibility.

Dr. Walker. Nutrition takes place by means of fluids, and no other means. Experiments have proved to him that vast changes can be made by attention to nutrition. It will be an important subject in the future. The process is simple. When the teeth have been softened, they can be restored by proper elements of diet, lime-water, etc.

Adjourned.—*Dental Cosmos.*

See next month's *Journal* for continuance.

ARTICLE IV.

The Rubber Dam.

Many and great are the difficulties which dentists have been compelled to meet and contend with, in the prosecution of their arduous duties, through all the past history of the profession.

Many of these difficulties are intrinsic to the operations themselves, and are quite enough to tax all the skill, patience, and nervous force the practitioner possesses.

But in addition to these are others intimately connected with, though not part of the operations, which materially increase the labor, and in large measure detract from the perfection of the result, in consquence of the limited control which it has been possible to gain over them.

One among these, and perhaps the greatest, is the danger of inundation from saliva, and the consequent ruin of the work. Hours of valuable time have been spent and lost in unintermitted battle with this aggressive foe. If the conflict

resulted in victory, that victory was shorn of much of its pleasure by the excessive weariness consequent upon the protracted struggle which preceded it. If in defeat, the mortification of that defeat was intensified by the exhaustive waste of nervous force, and the terrible prostration which was its natural result.

Numerous methods and appliances have been devised and introduced, through the years past, for the purpose of controlling this difficulty. By the faithful and persistent use of some of them, a degree of success has been achieved, and good operations performed, though always at the expense of great labor to the practitioners, and great weariness to the patient. Oftentimes tedious operations, such as are termed "building up," or making "contour fillings," have been brought nearly to completion, when in a moment, by some slight movement of the patient, or the sudden saturation of a napkin, or a copious discharge from a neighboring gland, a "tidal wave" has swept over the structure, and in a twinkling the whole been ruined.

Clamps for compressing the duct of Steno; tourniquets for holding coils of linen, or compress of various materials; pumps for removing the accumulated saliva; wooden wedges driven tightly between the teeth to dam up the watery emissions; waxed ligatures wound closely around the necks of teeth; tongue holders; indeed, almost every conceivable contrivance has been tried, with varying degrees of success, but still the obstacle remained, a sore vexation and hindrance to the dentist whose aim was thoroughness and durability.

But at length a bright day dawned—a day of conquest, of rejoicing, of relief. A happy thought entered the mind of Dr. S. C. Barnum, of New York City. Acting upon it, he devised and introduced a system of dealing with the dentist's arch enemy—saliva—at once practical and certain. This method consisted of using a thin sheet of India rubber, a material absolutely impervious to moisture, and so enveloping the tooth to be operated on, that perfect dryness can be secured during the longest operation.

After testing his new discovery, and proving its efficacy, he most generously gave it to the profession without restriction and without charge—a noble, unselfish act. Since that day blessings innumerable have been invoked upon his head by dentists and patients. Increased facility in the use of the Rubber Dam has marked the passing months, until it is daily demonstrated that the appliance is capable of universal application and worthy of universal trust. Neither is it too much to assert, perhaps, that no new thing has been introduced to the profession, among all the vast array of inventions for ten years, which has been productive of so much comfort, and such good results, as Dr. Barnum's Rubber Dam.

This being the case, it may not be amiss to consider its virtues somewhat critically.

By the use of the Rubber Dam greater thoroughness of operations is secured.

1st. In the preparation of cavities.

No cavity can be perfectly excavated and prepared, unless every part of it is clearly seen. When moisture continually fills the cavity, only an imperfect view of it can be obtained.

Rays of light, as is well known, are refracted by passing through fluids, so that, in looking into a vessel filled with water, the sight does not strike directly upon the point at which it is aimed, but upon another; for the line of vision is refracted or bent when it strikes the surface of the water, and the beholder is deceived; but when the vessel is empty the line of vision is direct from the eye to the precise point looked at. Now, if a cavity is filled with saliva, it will be at once perceived that there is less certainty of every point in that cavity being distinctly seen, and if not distinctly seen, then of course not surely reached by the preparing instrument.

Again, if the floor or walls of the cavity are covered with moisture, although not to such a degree as to refract the rays of visual light, still a glistening surface is given to the interior, which in a measure conceals or obscures it, and its

exact condition is not so perfectly determined as when absolutely dry. This will not be disputed.

Now in preparing a cavity located on an approximal surface of a tooth, there is a constant invasion of saliva, producing the unfavorable results already referred to, and necessitating the continuous use of some absorbent, such as spunk or paper, to obviate the difficulty. But let the Rubber Dam be applied, and no hindrance from encroaching moisture is encountered. The entire interior of the cavity is clearly seen, its condition certainly determined, the instrument applied at the very point where it is needed, and a satisfactory preparation secured in all cases.

It is also contended that the application of the Rubber Dam to teeth, previous to preparation, reduces the pain of excavating sensitive dentine. Whether this is in consequence of the cut ends of the tubuli emptying themselves into the dry cavity, thus reducing the quantity of nervous fluid (if it be a fluid) which they contain, and consequently losing something of their conducting power, or whether the acuteness of sensibility which the said nervous fluid (?) possesses is somewhat obtuned by the unintermitted contact of atmospheric air, or whatever may be the cause, the desirable result is the immediate product of the Rubber Dam, and is to be set down to its credit.

When a cavity is prepared, and the filling ready to be introduced, no moisture can creep in under the gold · every piece can be placed just where it is desired; it can be thoroughly compacted; perfect cohesion of all the layers can be uniformly gained from first to last; no undue haste need interfere with the bestowal of all the care which is required, no premature termination of the operation is rendered necessary by the approach of the insidious foe, but the last piece can be put in as deliberately as the first, and the whole finished to the mind of the operator.

There is an array of advantages sufficient to commend any new thing, and it is no idle boast to claim all these for the Rubber Dam. But we can go a step further and consider the next of the trinity of desirable ends.

2d. By the use of the Rubber Dam the comfort of patients is greatly promoted.

No packing of the mouth with napkins is required. These distress a patient exceedingly, and are often quite painful, as well as uncomfortable.

No clamps upon the tongue or cheeks are necessary. The sense of being held in a vise is not experienced.

No cramping and straining of the muscles of the cheek is felt.

The terrible weariness caused by long continued holding of the mouth open, with no possibility of closing it through a tedious operation, is spared the patient, for he can occasionally close it without damaging the operation, and thus obtain most grateful relief.

The fear of strangling by reason of labored and imperfect deglutition is avoided, for the patient can swallow at frequent intervals, and in a natural manner.

The fear of spoiling the operation by an injudicious or necessary motion is not felt by the patient. He can be assured that no danger can result, so that his mind remains undisturbed through the entire sitting. And this is no slight matter. Patients often express themselves as completely "wearied out" by the constant apprehension that they might in some incautious manner do fatal damage to the operation. Take away from them this anxiety, and much is done for their comfort while they are in the chair.

This long army of good results, be it remembered, is to be set down to the credit of the Rubber Dam.

Next, expedition is promoted by the use of this appliance.

No time is lost in constructing and operating defences against saliva. The whole attention of the dentist can be devoted to his work. Having a feeling of security, his manipulations are without nervous haste, well directed and effectual, and the result is more rapid progress toward completion. Again, the operator's mind being free from apprehension, there is no diversion of his thoughts. He places his gold just where he desires, and drives it home,

while the satisfaction he experiences at the perfect control he has over the case imparts celerity to his hand, and the result is expedition.

Experience in the use of this appliance will enable the dentist to adjust it in every case, and the new inventions of clamps, together with the method, already familiar, of using ligatures about the enveloped teeth, will effectually secure it in place, and present to the eye and hand of the operator, the objective point of his labor.

Is it not necessary at this day to enter into details as to the *modus operandi* of applying the Dam. The profession pretty generally understand these details. It may not be amiss, however, to give a few suggestions drawn from experience.

A large sheet is more convenient than a small one. The ends hang out over the shoulders, and the curtain falls down over the chin so far as to retain their place and keep out of the way. Small pieces are continually curling up and obstructing the sight, or presenting an advantage to the saliva, unless the piece is constantly held.

Several teeth besides the one or more to be operated on should be enclosed by the rubber, as a better view is obtained, and less hindrance experienced by folds of the appliance. On short or conical crowns, where the shape is unfavorable for holding the Dam, one of the recent improved clamps, slipped down to the neck of the tooth over the rubber, will hold it effectually.

The ingenuity of the dentist will suggest various little devices for the conquest of minor difficulties which may arise in connection with the use of the Dam, by the employment of which they will vanish before him. And to the ingenuity of the dentist these must be left.

To sum up it may be said: By a progressive and faithful dentist, nothing valuable is disregarded, and among all valuable adjuncts and accessories placed at his disposal, he will find none more promotive of good to himself and his patients than Dr. Barnum's Rubber Dam.—*Dental Miscellany.*

ARTICLE V.

Excision of the Superior Maxillary.

BY D. KELLER, M. D., PARIS, KY.

In the month of March, 1869, assisted by Drs. L. D. Barnes, Washington Fithian and others, I removed the right superior maxillary bone of a negro woman aged fifty years.

This operation was rendered necessary by the disease of the antrum, which had existed for two years, and resisted all remedies applied for its removal or mitigation of the intense suffering consequent upon it.

For more than a year, unless under the influence of morphia, there had been no rest, day or night. The operation having been determined upon, an incision was made, beginning at the inner canthus, extending to the angle of the mouth, and another from the alæ of the nose to the zygomatic fossæ, and thence in a perpendicular line to the temporal fossæ. The flaps now being dissected up and turned back, the anterior wall of the maxilla was brought into full view. With pliers, the division along the nasal line was effected, and with trephine, mallet and chisel, the subsequent steps for removal were completed.

In the removal of the orbital plate, the globe of the eye was carefully dissected up and raised, to prevent injury to that organ. The walls of the antrum were thickened to the extent of an inch, and required the use of the trephine in making an opening into the cavity, thereby lessening the difficulty in completing the removal, as it gave a good starting point for the saw or chisel. The orbital rim, being found in a healthy state, was not disturbed, while the floor of the orbit and posterior wall were necrosed, which were removed and actual cautery freely applied. After sponging out the wound thoroughly and all hæmorrhage had ceased, the flaps were brought down, properly adjusted and confined by sutures, a cold-water dressing was applied, and a full dose of morphia administered.

On inquiring next morning of my patient as to how she had spent the night, she replied that for the first time in a year she had a good night's rest

It is surprising how little deformity exists after such an operation, and how little the process of mastication is interfered with. With the exception of the facial scars, and slight caving in of the cheek, there was nothing left to show that such an operation had been performed. In six days the external wound had healed, and in a few weeks my patient had resumed her usual avocation, entirely relieved of all suffering, and remained well for two years, when she was attacked with dysentery and died, as I am informed.—*Medical Weekly.*

EDITORIAL. ETC.

The Thirty-fifth Annual Session of the Baltimore College of Dental Surgery.—The preliminary course of lectures of this institution began October 15th, the introductory having been delivered by Professor E. Lloyd Howard.

The friends of the College will be gratified to learn that the present session bids fair to be one of the most successful in its history, the number of students present at the preliminary course being more than one half larger than for several years past.

Germany, England, South America, Guatemala, Jamaica, Canada, and the West Indies, together with nearly all the Southern, and a number of the Northern States are already represented; and as the majority of students enter during the

first week of the regular course, which begins November 2nd, there is every reason for believing that the present session will prove a most prosperous one for this, the oldest Dental College in the world.

Among the students is another lady from Germany, who, there is every reason to suppose, will do as much honor to herself and the institution, as the two former female graduates; both of these, Misses Foeking & Jacobi, having graduated with high honors, are now very successfully practicing their profession in Berlin, Prussia.

Although some have endeavored to make the admission of females into the profession a matter for censure, and, in order to advance the interests of others less worthy, have gone so far as to reflect upon the Baltimore College yet the Faculty, so far from regretting their action in this respect, are very well satisfied to affix their names to the diplomas of all of the opposite sex, who may prove as well qualified at the final examination, as those who have already graduated from the Baltimore College of Dental Surgery. None have so far applied for matriculation, who are not ladies in every sense of the word, besides being well educated and bringing the highest testimonials.

Since the last session the College Building has been enlarged nearly one half, and presents as fine an appearance as any institution of the kind in the country. In addition to the new part of the building, both the Lecture Room and Infirmary have been enlarged. The new addition contains the Museum, a Dissecting room, and en Operating room for the extraction of teeth and the administration of anæsthetic agents, altogether separate from the Infirmary proper.

The Infirmary practice is very large and steadily increasing, the College Building being situated in the best location in the city for such a practice. New appliances have also been added, and every care taken to insure a thorough course of instruction.

Spongoid.—In the *Dental Miscellany* Dr. J. A. Kimball, notices this new absorbent as follows:

"Not having seen any reference to this article, recently introduced into the department of operative dentistry, I take the

liberty of calling attention to it. Having employed it constantly for the past three months, I am of the opinion that it is of sufficient merit to deserve a friendly recognition at the hands of the dental profession.

To those who have had no opportunity of examining it, a brief description may be interesting. The article is designed, so far as its application to dentistry is concerned, to supply the place of prepared cotton, spunk and bibulous paper in drying ordinary cavities. In appearance it resembles white blotting paper, and the substances of the two articles are doubtless quite similar; but the spongoid is more fibrous and much less compact, owing, of course, to a different quality of material and a different treatment in the process of manufacture. And even common blotting paper is not a contemptible absorbent for dental purposes, as I learned years ago while treating a tooth for a little patient in the country, without the usual accessories of the office.

The spongoid is prepared in three forms: first, in small round discs; second, in long strips about one-fourth of an inch wide, and third, in square sheets nearly the size of a sheet of gold foil. I prefer the latter form for ordinary use, as it can easily be torn into pieces of any required size and of sufficient softness to be pressed into all the inequalities of the cavity to be dried. The three forms are of various thicknesses, to enable them to meet all cases. The discs are of different sizes, and possess the advantage of being always ready, while the strips give less trouble than the sheets in reducing them to pellets of suitable dimensions; yet the process of cutting so condenses the edges of the discs and strips as to greatly lessen their adaptability, and for this reason, principally, I choose the sheets.

The absorbing power of this substance is marvelous. Place a drop of water upon a slab and approach it gradually with one of the discs. Upon the slighest contact the drop instantly disappears, and the disc becomes uniformly charged with the moisture. Dip one end of a strip of spongoid in a glass of water and almost immediately the fluid ascends to its entire extent and the strip is completely saturated. Nothing but the best of marine sponge can equal the spongoid in its absorbent properties.

Regarding its practical employment, I see no reason why the spongoid should not supersede, in ordinary cases, all substances heretofore used. It cannot, however, supply the place, of cotton in drying pulp cavities, nor that of the arch detective spunk in discovering the presence of slight moisture. I venture no extravagant predictions concerning the spongoid, but I dare say it will, sooner or later, of its own intrinsic merit, assume its proper and natural place in the dentist's repertoire, and become a valuable adjunct to his operations.

It is, doubtless, in surgery that this preparation will find its most important and appropriate work. For this department it is medicated so as to act as a styptic, an antiseptic, a counter irritant and vesicant, an anodyne or a disinfectant, as well as an absorbent. It is needless to suggest that these medicated forms may be of occasional use in our own profession. I have myself employed the styptic spongoid, and find it admirable. It is less unpleasant and far more convenient and cleanly than Rohland's styptic cotton, and equally effective as an article of ready application. There are sheets expressly prepared for large suppurating surfaces by being thickly perforated. The sheet itself, which has been treated with carbolic acid, or some other antiseptic, absorbs and neutralizes the serous portion of the effusion, while the more concrete portion escapes through the small openings, and is removed when the sheet is detached. An eminent surgeon of this city assures me he finds it of great value in this class of cases, and it has been successfully employed in Europe for similar purposes.

In conclusion, I may perhaps be permitted to say, incidentally, that in my practice I use absorbents but little. Where there is danger of the cavity becoming wet in excavating, I usually attach the Rubber Dam, and it is then in place when I am ready to insert the filling. The dentine is less sensitive if excavated dry, and the debris of excavation does not require the syringe, as it may be most thoroughly removed by a bit of cotton or spongoid slightly dampened with chloroform. That the latter agent in evaporation leaves no moisture behind, I have repeatedly proved in cases where the gold became accidently wet during the process of filling. After adopting means to prevent any further access of saliva, I have bathed the sur-

face of the interrupted plug with chloroform, and when the volatile fluid had escaped, proceeded with the operation, the gold adhering with almost, if not quite, the same tenacity as if nothing unfavorable had occurred."

Salivary Calculus, Etc.—We are indebted to Dr. M. A. Berry, of Hagerstown, Maryland, for several very large specimens of Salivary Calculus, in one of which is imbedded the half of the root of an inferior central incisor. How the patient could tolerate such enormous deposits of this substance is a mystery.

These specimens have been placed in the Museum of the Baltimore College of Dental Surgery.

We are also indebted to Dr. J. D. Patterson, of Leavenworth, Kansas, for a plaster model of a mouth where almost half of the hard palate and alveolar process have been destroyed by tertiary syphilis.

Also to Dr. J. W. Meng, of Lexington, Missouri, for a plaster model showing the effects of the inferior teeth on the alveolar process of the superior maxillary, after all of the upper teeth had been removed and no artificial ones substituted. The inferior teeth have made an indentation in the gum and alveolar process fully one half of an inch in depth.

Also to Dr. Jas. L. Nehon, of Lewisburg, West Virginia, for several teeth with exostosed roots, the removal of which relieved severe neuralgia.

All of these specimens have been placed in the Museum of the Baltimore College of Dental Surgery.

BIBLIOGRAPHICAL.

Clinical Lectures on Diseases of the Nervous System. By William A. Hammond, M. D., Professor of Diseases of the Mind and Nervous System in the University of the City of New York, etc., etc., etc. Reported and Edited, and the Histories of the Cases prepared and edited by T. M. B. Cross, M. D.

These Clinical Lectures were delivered at the New York State Hospital for Diseases of the Mind and Nervous System, and at Bellevue Hospital Medical College by Prof. Hammond, and are reported in full, together with the histories of the cases, by Dr Cross, after careful study and prolonged observation, with the hope that they may serve to add something to the clinical literature of nervous diseases.

The names of the author and compiler are sufficient to show the value of the work, which is gotten up in a handsome volume by the Publishers, D. Appleton & Co., New York.

Instructions in Manipulations of Hard Rubber or Vulcanite for Dental Purposes. By E. Wildman, M. D., D. D. S., Professor of Mechanical Dentistry in the Penna. College of Dental Surgery. Sixth Edition. Publisher, Samuel S. White, Philadelphia, 1875.

The number of editions is proof of the value of this work, which is written in an easy and comprehensive style, and after Professor Austen's instructions on Plastic Work in the last edition of Harris Principles and Practice of Dentistry, forms the best treatise published. All that it is necessary to know concerning "Vulcanite Work" is contained in this volume, which is hansomely bound and printed in large type on good paper; and is altogether in keeping with the productions of its enterprising publisher.

The Physician's Visiting List for 1875. As useful for a dental engagement book as any other in use. Published by Lindsay & Blackiston, Philadelphia.

MONTHLY SUMMARY.

The Connection of Cancer and Skin Disease.—Mr. George Gaskoin cites a number of cases in the London *Medical Times and Gazette*, to show the close relation between cancer and skin diseases. Thus, a boy with psoriasis has a sister with malignant disease; a man with psoriasis palmaris can give me no clue to his complaint beyond the fact that his grandfather had cancer. I have been inclined to believe that psoriasis lay closer to cancer than any other skin affeetion, but I am a little shaken in this opinion by what I have recently observed of acne in the children of the cancerous. Until lately I was disposed to look upon acne as a reverberation—a distant echo—of the cancer; but in many instances I find its succession close and direct. I have seen several cases of psoriasis where the tongue is affected as well as the cutaneous surface; many of these are not syphilitic. I cannot conceive that to such affections of the tongue one should deny the name of psoriasis; but no one case arises in my memory of epithelioma affecting the tongue where psoriasis was simultaneously displayed upon the skin, and the record of such a case is very desirable. It is now some years since I removed the tongue for an epithelioma supervening on a condition which I perfectly recollect, having observed every stage of its growth. The disease began in denuded patches, and there were hard portions, but not of that thickness I find recently described. These descriptions correspond very well to the horny and corn-like masses we observe in palmar psoriasis. Certainly it could never have entered into my mind to call such a condition ichthyosis. And here, as in the instance before mentioned, in spite of the advance in histology, I do not see marked out any broad and sharp line by which we can divorce cancer from its congeners, if I may so term these diseases of the skin. I will not go so far as to claim for cancer the character of a skin disease, but when we look at the variety as well as prodigality displayed in the expenditure of epithelium as seen in psoriasis, one cannot but here acknowledge so very close an affinity as to bind attention to the common character of each, both clinically and histologically. The affinity of lupus with psoriasis is well apparent in the clinical room; and this reminds me that certain forms of lupus in the extremities have been

recently brought forward in Germany, which in the histological elements are scarcely, if at all, different from epithelioma.

As regards acne, I will say that in connection with it one will hear more of cancer than with any other disease that affects the skin; and the inquiry does not lead to epithelioma only, but to cancer in all its forms. I once thought that acne punctata gave far better fruit of inquiry than the other two; but both with acne simplex and acne rosacea (especially in women) I have found the parents to have been cancerous; I do not say very often, but sufficiently ofton to establish a firm connection. In some cases, all, or more than one, of the children have acne. Acne punctata is mostly accompanied with that sluggishness of temperament which some have identified with the cancerous diathesis.—*Med. and Surg. Reporter.*

Gelseminum in Odontalgia.—I desire to draw attention to the value of Gelseminum sempervirens in the treatment of some forms of odontalgia. Since reading Dr. Wickham Legg's paper, published in May last, advocating the employment of the drug in cases of odontalgia, I have frequently used the remedy for relief of toothache and some allied affections among my out-patients. Gelseminum, commonly called the yellow jasmine, is not very generally known to English practitioners, although it has been largely used in medicine for some years in the United States. The drug seems to act mainly upon the nervous system, impairing the sensibility of the sensory nerves. American pharmacists prepare a liquid extract; the dose of the powdered root is from one to two grains. I have used a tincture made from two ounces of coarsely-powdered gelseminum-root macerated in a pint of rectified spirit. In hospital out-patient practice, we meet with a large number of cases of neuralgia pains in the face and jaws, associated with carious teeth, but unconnected with any evident local inflammatory changes. The patients are frequently badly-nourished women. In such cases I have given the tincture of gelseminum in doses of fifteen minims every six hours in an ounce of dill-water. Out of about twenty cases, I do not think the use of the remedy has failed to be followed by decided and lasting relief in more than three or four instances. The pain did not usually disappear till after the third or fourth dose. I have seen enough of the employment of gelseminum to feel sure that more extended experience and careful investigation of its action will establish the drug as a valuable addition to our materia medica.—*Dental Cosmos.*

How to Pull Teeth.—The following, sent us by a reader, we respectfully refer to our Dental exchanges:—

A peculiar dental operation has just come under our observa-

tion. A certain citizen had an upper tooth which was loose and troublesome, so he resolved to extract it by fastening a string to it; but after a trial, finding the operation pained, he hadn't the grit to grin and bear it. He thought if the tooth could be extracted by some sudden mode, the pain would be but transient; and, after mature deliberation, he hit upon an ingenious plan to jerk it out in a jiffy. Procuring a heavy flat-iron, he tied it to the other end of the cord attached to his tooth, then shutting both eyes he let the iron "drop," which descended plumb centre on his pet corn. After hopping about the room, wildly, on one foot, groaning for very anguish of spirit, and reciting choice passages from profane history, he finally calmed down sufficiently to hurl the flat-iron over the fence, and swathe his sore toe in camphor and cotton. But, he pulled the tooth, and with it a piece of gum the size of a beefsteak. And the man lived.—*Med. and Surg. Reporter.*

Oleate of Mercury in Treatment of Ringworm.—Dr. Kane (*London Lancet*) describes several cases in which he had used the oleate of mercury in treating ringworm. He says it has the following advantages over other remedies:

1. It is a *certain remedy*, if carefully applied.
2. It *produces no staining* or injury of the skin. This is of great importance where the disease appears in the face.
3. It is *painless* in its application, which is not true of the strong parasiticides.
4. It *readily penetrates* the sebaceous glands, hair-follicles, and even into hairs themselves. Thus it is more likely to destroy the fungus than spirituous or aqueous solutions of mercury.

In very sensitive skins the irritation sometimes produced by it may be avoided by reducing the strength of the solution, and appplying it with a camel's-hair brush. The ordinary strength of the oleate is ten per cent.—*Nashville Journal of Medicine & Surgery.*

A Lost Case.—A physician in Vienna, Wis., who recently sued a man for services rendered in the treatment of his son for fracture of the thigh bone, lost his case. The local paper says that after the plaintiff had proven his case and rested, counsel for the defendant moved for a nonsuit, under chapter 95 laws of 1867, which in effect provides that no person practising physic and surgery shall be allowed to collect fees for services rendered unless he is a graduate of some medical college, or is a member of the State or some county medical society. The lawyer claimed that the plaintiff's duty was to prove he was a graduate, or was a member of one of the societies mentioned, and inasmuch as he had not done so, the defendant was entitled

to a nonsuit. The motion was sharply resisted by the counsel for the plaintiff, but the defence sustained the theory by authorities, and the Justice dismissed the case.—*Med. Record.*

To Suppress Hæmorrhage in the Mouth During Operations.—Professor Andrews, of Chicago, (Med. Examiner,) advises when hæmorrhage interferes with operations in the mouth, to use the atomizer with ether, after etherization by inhalation, if the latter should be deemed necessary. He says that it does not interfere with the operation, that it restrains bleeding, and that the inhalation of the vapor, from the spray, keeps up a sufficient degree of anæsthesia.—*Medical Weekly.*

The Medical Education of Women.—Miss Philomene Ratinckx, of Antwerp, has passed a brillant examination in the anatomical sciences before the combined jury of Ghent and Louvain for the faculty of medicine. She has also obtained the royal diploma for the treatment of clubfoot. Two Circassian ladies at the Russian Academy of Medicine and Surgery, propose to return to their own country to practice the profession when they have taken their degrees.—*London Medical News.*

Longevity of Medical Men.—According to Casper the average age of clergymen is 65; of merchants , 62; clerks and farmers, 61; military men, 59; lawyers, 58; artists, 57; and medical men, 56. The medium duration of life in Russia he states at about 21 years; in Prussia, 29; in Switzerland, 34; in France, 35; in Belgium, 36; and in England, 38 years. It has been calculated by some statisticians that, under ordinary circumstances, men can live six or seven times longer than the years required to attain puberty. Taking this at the fourteenth year, from 84 to 98 years of age would be the natural life. The *Medical Times and Gazette* lately argued that medical men in England stand high on the scale of longevity. The united ages of twenty-eight physicians who died last year amount to 2,354 years, giving an average of more than 84 years to each. The youngest of the number was 80, the oldest 93; two others were 92 and 89 respectively; three were 87, and four were 86 each, Sir Henry Holland being one of the latter. There were also more than fifty whose average age was between 74 and 75 years. —*Doctor.*

Cremation.—According to *The Lancet* cremation makes progress in Germany, eighty-two cities now possessing cremation societies. The society at Berlin has received intelligence that

the new furnace invented for the combustion of bodies by Professors Reclam and Siemens was tested on the 3d of June, and completely satisfied its constructors. Two hundredweights of animal carcass were consumed in about an hour and a half—reduced to white ashes, at no more than three shillings outlay. During the process no sound nor smell was appreciable. Solving as it does the question of cremation, Messrs Reclam and Siemens' contrivance has just met with a rival in the device of Dr. Steinbeis, President of the Central Institute for Trade and Industry, Wurtemberg. He proposes that the corpse should be placed in a trough made of cement, and be filled up with liquid cement so as completely to cover the dead body. The cement soon hardens and absorbs all the moisture from the body—converts it, in fact into a preservable mummy at small expense and trouble. As soon as the cement hardens, the square coffins may be piled one upon the other like blocks of stone, and the corpse is literally interred *in* instead of under its gravestone.—*Med. Record.*

Table-fork swallowed by a Crazy Man; five or six years afterwards the Patient committed Suicide, when the Fork was found in his Stomach.—A case of this kind had been communicated to the *Union Medicale*, April 9, 1874, by Dr. Baillarger.

A second case, communicated by M. Lascols, is published in the same Journal for 11th April. The subject of it was a married woman who in a fit of anger left her husband to go to her mother. When alone in her chamber she secretly swallowed a table-fork, a servant was charged with having stolen it, and the lady, though requesting that the servant should not be accused of the theft, did not reveal what she had done, and she lived as usual, not suffering much pain. After some months, however, the fork caused her pain and produced an enlargement of her stomach. A consultation of physicians was held, and M. Quairoche made an incision into the stomach and withdrew the fork, which had become perfectly black. The patient recovered and subsequently had children. Several similar cases are referred to in *Gaz. Hebdom*, for April 10, 1874, p. 228-9—one recorded as early as the year 1716.

The Danger of Mixing Chromic Acid with Glycerine—In preparing mixtures of this kind, which have been so highly recommended for diseases of the mouth and throat, care should be taken not to add these reagents together too quickly, for it is said that the fluid may take fire and explode. There is no danger if the glycerine be added drop by drop, for then a little warmth only will be generated.—*Il Raccogl. Med.*, *Memorabilieu*—*Med. Record.*

[illegible] UBBER.

[illegible] d, 1874.)

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ARTICLE I.

Epithelial Cancer of the Tongue.

BY DR. HUBBARD.

Read before the California State Dental Association.

The definition Woods gives of the subject announced above is, that "it is that kind of cancer which assumes the form of an irregular and exuberant deposit of cells identical with, or at least resembling closely, those cells which form the normal covering or investment of mucous membrane and skin, and which are called 'epithelial,' and are, so to speak, formations germain to the parts affected." The common forms of disease are included by Hanover, under the name *ephithelioma*.

It is considered by the best pathologists I have been able to consult, to resemble so closely in its course and effects the real carcinomatous diseases of scirrhus and cephaloma, as to entitle it to the fatal distinction of being placed among the cancerous diseases; while others consider it to be cancroid, or resembling it in its characters. The most charac-

teristic features are its uncontrolable growth; its progressive invasion of neighboring tissue; its supplanting or pushing aside and destroying the growth of the normal structures; the very severe darting pains which attend its course, caused by its involving the ultimate fibrels of the nerves of the part, in the same manner, perhaps as a corn affects them under the pressure of the boot; its liability to invade the lymphatics, and so to make its way into the system; and its occasional recurrence in the deeper organs and viscera, sometimes as ephithelial deposits, and sometimes as one of the more decided malignant growths, namely "encephaloma."

On the other, hand it is more tardy in its fatal progress than the more virulent forms of carcinoma, and is much less apt to recur in the deep seated viscera as a secondary deposit, though its progress resembles in many important points that of scirrhus or hard cancer, especially that aspect of the latter, in which the advocates of its local origin and slow continuously progressive course view it; and sometimes its microscopic elements can, taken by themselves, with difficulty be distinguished from some of the cell forms of scirrhus cancer.

This is especially the case in that form of indigenous cell, designated by Pagot as "broad cells," where more than one nucleus is seen enclosed in a mother cell, as is usually the case in hard cancer. In some of its more mild manifestations, epithelial cancer can scarcely be distinguished from an ordinary warty growth, such as that which is common enough on the hands of young persons. In both may be observed the masses of clustered, more or less flattened, epithelial cells, lying upon each other concentrically, like the layers of an onion, with little or no fibrous or connective tissue, and forming by the intimate adhesion of the cells themselves a very tough, hard resisting mass. It is only by the persistency and recurrence of the growth, the pain which attends it, its gradually spreading beyond the site originally affected, and its effects upon the general health that epithe-

lial cancer can be distinctly diagnosed. In many cases the disease is said to become developed out of so called benign warty tumors, which are consequently usually suspiciously viewed by practical surgeons. And it may be said that the more closely adherent, hard and slow growing the tumor, the less disposed it is to ulcerate, and the less painful in its manifestations, the less dangerous its character may be estimated to be; while conversely, the more loosely its cells are held together, and the more disposed it is to become disintegrated and to form an ulcer, the more rapid is its course, and the sooner do the lymphatic glands become affected. I find some cases recorded in the "Transactions of the Pathological Society of King's College Hospital," (to which I was allowed access by courtesy of G. G. Tyrrell, M. D., F. R. S.,) in which the amount of fibrous stroma produced by the development of fibre-cells in the mass is so great that the disease assumes a more doubtful pathological character, and may be assigned to another place in the classification of pathologists, more closely approaching to the scirrhus form of carcinoma. Dr. Clark, in his monograph on the diseases of the tongue, states that he believes some cases of so called scirrhus, to have been of this kind. Again, the disintegration of the cell growth may be so rapid that the features of the disease may assume the form of an open ulceration of a malignant character rather than that of a tumor; and many such cases I doubt not have been denominated "Cancerous Phagedæna." In conclusion then, I would say, that as a general thing the more advanced and minute pathological observations become, the less disposed are practical men to draw any broad line of demarcation between these diseases. In well marked cases the signs are plain enough; but at a time when diagnosis is most valuable, the indications are usually the most slight.

To remove the disease, the least painful, most manageable, and most effective plan is no doubt by the application of the knife. Caustics in this situation work too slowly and superficially, and too painfully and uncontrollably to be

valuable in any other way than as secondary to the absolute removal of the diseased mass. Used in this way, they are of great value, and were employed by me in the cases I have had in the form of a solid or saturated solution of the chloride of zinc, sometimes combined with the perchloride of iron, and frequently applied to destroy any remains of the disease which may have escaped the knife. The latter has also the additional advantage of stopping any bleeding that may still further lower the resisting powers of the patient to the invasion of the disease.

In most of the books I have been able to find, the operations for the removal of the tongue, or any part of it, has been considered as one of those in which the blessings of anæsthesia could not with safety be afforded to the patient, for the reasons that will be at once apparent, viz: first, the removal by the anæsthetic agent of the voluntary assistance which the patient can render in all operations upon the interior of the mouth, by keeping the jaws and mouth wide open and the tongue steady; and secondly, the supposed danger in profuse bleeding into the pharynx of suffocation, by the blood passing into the larynx and trachea. It is very evident that if we cannot in these cases offer to our patient a means of relief, unattended by immediate pain, and that of a most severe character, at least half of the advantages of and inducements to the treatment involving such an operation are thrown away, and the patients will be naturally indisposed to listen to the only promise of relief which can honestly be held out to them. If then we can render by any means the necessary operations painless, we confer, I think, a boon upon humanity not by any means small, to the poor creatures thus afflicted. After some little contriving I made a gag, which I think meets every case, and enables the surgeon to use anæsthetics with some degree of safety. It consists of four teeth plates, which act on both the upper and lower bicuspids by means of a pair of powerful cross levers, placed outside of the cheeks, and opening independently of each other by a screw on each side through

a simple hinge joint. Having thus obtained the necessary control of the movements of the patient's lips and jaws, during the insensibility produced by chloroform, we have only to look to those precautions which are usually found most efficacious, such as turning the head down to one side and clearing the throat with the finger. If the knife is to be used, I have found it to be the best plan to pass two stout ligatures through the base of the tongue, by means of a curved needle—these ligatures are held by an assistant. By this means we have the tongue extended to its utmost limits, and by being widely placed they prevent the turning out of sound fleshy substance, which is very apt to be the case when the ordinary vulsellum forcep is used. If the tumor is likely to be very vascular, as may in some measure be divined from its appearance, I deem it prudent to pass a broad ligature across the canine arteries, under the base of the tongue, by means of a curved needle; this controls the hemorrhage until the cut ends of the vessels have been secured. The tumor is next seized by a pair of stout double toothed lioned forceps, and then a curved, sharp pointed vistoury is used to transfix the tongue close to its base, and to cut first antero-posteriorly, and then laterally across the vessels and nerves, until so much has been cut as will suffice to rapidly clear away the diseased mass. In securing the arteries, much steadiness on the part of the assistant is required. The muscular substance of the tongue is so friable, under the circumstances, that it is readily broken down by too much vigor in drawing the knot; while the depth at which the cut vessels lie from the surface necessitates dexterity in slipping the thread over the forceps, the points of which should be conical and taper quickly to the end. The proper tying of the vessels, and the prompt application of the tincture of the perchloride of iron and chloride of zinc, by a strip of lint tied round a stick, will render the use of the arterial cautery rarely necessary to subdue the hemorrhage. In conclusion to the pathology and cure of the above disease, I will give two cases which

I have had during the last year. In Febrnary, Albert Stanchfield came to my office for treatment; he had noticed pain and soreness in his tongue, so long as ten years ago. Thinking it was irritated by the molar teeth on that side, he had them extracted four years ago, although they were perfectly sound; twelve months before he noticed, for the first time, that it was rather swollen and hard. The pain becoming worse six weeks before I saw him, he began to emaciate, and the cancer got rapidly larger and more painful, and the ulceration spread further. On examination I found a tumor about the size of a small egg on the left border of the tongue, hallowed out in the middle by an extensive ulceration, covered with an ash colored slough, and surrounded by fungus raised edges, with a very fetid discharge—frequent hemorrhages had occurred from the middle of the sore. A sub-maxillary lymphatic gland could be felt, enlarged and hard on the same side. There was a copious and distressing flow of saliva, and the poor man suffered excruciating agony both night and day; the effects of loss of sleep and suffering speedily became visible in his rapid emaciation and weak accelerated pulse. On the 9th of February, under chloroform, and aided with the gag I have described, I removed two-thirds of the tongue, cutting clear of the tumor, and afterwards taking away considerable portions which appeared to me to be rather suspicious in *feel* and appearance. Free hemorrhage occurred from the numerous vessels, which was with difficulty controlled, the substance of the tongue being exceedingly friable, and giving away easily under the ligatures. The chloride of zinc and the perchloride of iron were freely applied, both separately and in combination. A blackened slough was formed all over the sore which,aft er some days, came off, showing a smooth healthy and regular healing surface. The sore rapidily healed after a few applications of the solid chloride of zinc, which was employed to smooth down all irregular granulations; and on the 2d of March, the man looking vastly improved in health, free from all pain, and

able to eat and speak with more comfort than he had had since the disease appeared, was discharged with thè sore almost healed, at his own request, in order to look after his business in the country. The second case I will bring to your notice, was a well marked and advanced specimen of the disease of the tongue under consideration; it was sent to me by a Dr. in Auburn—a man aged forty five, a delicate man, evidently much worn by suffering and interference with the taking of food. On opening his mouth I observed a large solid tumor of the size of a hen's egg, embracing the whole of the left half of the tongue, commencing, as in all other cases, opposite the bicuspid and anterior molar teeth. The surface of the tumor was covered with a deep ulceration, with deep ragged edges, and deep sloughy-looking fissures, and exhaling a very offensive odor and putrid discharge. There was no affection of the glands apparent on careful examination; but the patient complained of deafness and much pain in the ear of the same side, probably from implication of the gustatory and chorda tympani nerves. He had great mechanical difficulty in mastication and deglutition, and has at times lost much blood by hemorrhage from the ulcerated surface of the tumor; pain, want of food, hemorrhage had reduced him to a distressing condition. The disease in this case commenced only in December, and pursued a much more rapid course than any other that I have been able to find any record of. It began at first as usual with a decayed tooth. As it was so near the annual meeting of this society, I thought if it were possible I would try and keep the case along, in order that we might get some clinical instructions from it, so I put him on a preliminary course of iodide of potass and tartrate of iron, touching it with solid chloride of zinc twice a day; but as no relief resulted from this treatment, and the poor man was getting gradually thinner and more cachectic from the constant wearing pain day and night, and the interference with his power of masticating food, I dared to delay no longer, and I operated two weeks ago. Much relief

followed this operation, which was attended with comparatively little hemorrhage. It is astonishing how rapidly the patient is recovering from this operation; freedom from pain, undisturbed rest at night, improved appetite, and revigorated digestive powers, account for this satisfactory result.

ARTICLE II.

Dr. C. S. Smith on Arthur's Treatment.

I object to the method of treatment advocated by Dr. Arthur, because I consider that it involves serious difficulties, both in theory and practice. It is true that Dr. Arthur tells us that his theory is based on the results of twenty-five years of practice of the method. But twenty or twenty-five years ago the teeth of adults were of a far better quality than those now presented for treatment, particularly in the younger portion of our patients; we are constantly finding the teeth of children seven to nine years of age so much decayed as to be beyond the reach of this practice.

We are too apt, in this as well as in other matters, to observe a fact, and then another one co-existent with or following it, and forthwith to conclude that the one is the cause of the other. If I may make use of a Latin term without being pedantic, he would say that we mistake a *post hoc* for a *propter hoc*, or a thing which happens *after* another, for a thing which happens *on account of* another. "A tooth has been filed; that tooth does not decay, therefore filing is a proper practice." This is superficial and illogical.

I would not change the shape of the tooth materially. It is our duty to restore the form that nature gave; if we destroy the shape of the teeth, we destroy in a measure the usefulness of the organs. It has been said that if it is good practice for the anterior teeth, it is also good for back teeth. This by no means follows; indeed, it is far from the case; for the anterior teeth may be very considerably cut away,

without interfering materially with their external appearance, or their effectiveness in incising or articulating. If we follow the practice in the back teeth, we reduce the denture from a set of mill-stones to a row of pegs.

A further objection to this method is, that it requires conditions to its success, that are quite impracticable. The children must be presented at the earliest age, and at stated times, and the appointments, made weeks or months in advance, must be kept, or the system is a failure, according to the author. Now, we know that children are, in ordinary practice, rarely presented until after some of their teeth are so far gone that it is next to impossible to save them. If we who practice filling teeth in place of filing, could see our patients as early and as regularly as Dr. Arthur requires, the loss of teeth with us would be of rare occurrence.

That little skill is required in this practice is claimed by the author, but this can not be true; the file in injudicious hands is a most dangerous instrument, and a good degree of skill must be necessary to carry this method into execution.

Another impracticable thing required is absolute cleanliness; the author admits that unless floss silk, &c., are used daily, or oftener, the system will fail. Now who of *us* is there, knowing as we do that we are dependent on cleanliness to save our teeth, that uses floss silk or rubber dam between his teeth after every meal, or anything approximating to it? We don't do it, and our patients, or a majority of them, won't do it.

ARTICLE III.

East Tennesee Dental Association.

The Eighth Annual Meeting of the East Tennesee Dental Association met in Knoxville, September 16th, 1874.

President Dr. M. F. Fowler in the chair.

Dr. Fowler read an essay on Pivot teeth. Dr. W. H.

Cooke one on Dental Neuralgia, and Dr. Protho one on Diagnosis. The essays were all ably discussed.

The following Resolution was unanimously adopted:

WHEREAS, Dr. John Foucke, of Knoxville, has been untiring in his efforts for the advancement of the Dental Profession, as well as each individual member of this Society ever since its organization; and, WHEREAS, we are indebted to him for valuable instructions, especially for his invention of the proper manner of preparing soft gold for building up teeth; Therefore, Resolved that the thanks of this Society are hereby tendered him, and we will ever hold him in grateful remembrance.

A Resolution was adopted requiring all the junior members to be examined on Human Anatomy, at the next annual meeting.

The following were elected officers for the ensuing year:

Dr. S. M. Protho, President; Dr. R. A. B. Myers, Vice President; Dr. S. B. Cooke, Recording Secretary and Treasurer; Dr. M. M. Harris, Corresponding Secretary.

On motion the Association adjourned.

Clinics were held daily by Drs. W. H. Cooke, R. A. B. Myers, and S. B. Cooke.

S. B. COOKE, *Secretary.*

SELECTED ARTICLES.

ARTICLE IV.

American Dental Association.—CONTINUED.

SECOND DAY.—*Morning Session.*

The subject of "Dental Pathology" was still under consideration.

Prof. Taft. Enamel may be diseased accidentally or hereditarily. There is great variety in enamel: some defects are transmitted; others are owing to an interruption of the nutritive process. It is often defective through absence of perfect crystallization; there are defective tracts, —atrophied portions, owing to disease occurring for a time. This is shown by spots of a different color, or grooves or pits, at the points which are forming at the time of the affection. Fissures present openings, especially in molars and on the lingual surfaces of the front teeth. There are defective tracts, beginning internally and extending to the periphery,—or part way These are different from pits, and are often found on the cusps. How do they occur? By their situation it is rendered impossible that anything should be retained which should cause decay by decomposition. Sometimes there is no organization; the materials are simply thrown together. The fibrillæ sometimes extend into and through the enamel. In one specimen he had examined, the largest number he had ever seen seemed to pass through. We should find out how these phases will modify treatment. We should understand at a view the structure of the teeth. Disease leaves its tracks upon all the tissues, and observe whether they are in their original power. The dentine is not open to observation, but still we may be able to discover something. We cannot under-

stand a portion of a science without covering the whole ground. Let us criticise as sharply as possible, and see how comes every defect; and endeavor if possible to redeem even those that are hereditary. We must stimulate one another to investigate at home. As regards the parasitic theory, he has not worked himself up to a great amount of interest in it. Because there are living animals in a dead carcass, it does not follow that they were the cause of the death. They play no important part in the decomposition of dentine. Worms and bugs in dead wood are not the cause of its death, but the result. Parasites have no material part in causing decay. The mode of penetration of caries proves nothing as to the agency of these animalculæ. How does it begin? Sometimes it is superficial and is arrested, sometimes largely beneath the enamel; sometimes it penetrates like a shot to the pulp-chamber. These varieties are easily accounted for. The structure between the enamel and dentine varies exceedingly in thickness and character. If it is defective, the decay will extend largely beneath the enamel. But if it is good, the decay will be penetrating. It operates in the direction most easily penetrated. Sometimes the decay-producing agent is concentrated, and most active at one point.

Dr. Spelman. Recent histologists discard the theory of parasites, and substitute that of vegetable or fungous growths. Parasites are found in every species of decay. When decomposition takes place, the open rods are exposed to acids and the leptothrix penetrate; as it progresses, they enter the tubuli and proceed till the pulp is reached. The most natural cause of caries is a growth of vegetable fungus, throwing out spores which articulate with the parent fungus. They develop best in an acid condition. The mouths of the tubuli are enlarged.

Dr. Watt. In regard to the "tooth-edge" business, we overlook the fact that it is not always traumatic; sometimes it exists where there are no natural teeth, and even seems to be located in artificial teeth. This is the same phenom-

enon as apparent pain in limbs which have been lost. An alkaline wash relieves temporarily. Microscopical examinations do not always reveal the "bugs." White decay is the most penetrating, and it is found in alkaline mouths. Alkalinity in mouths is due to the presence of ammonia; this, in contact with air, is converted into nitric acid, which attacks everything; it has a stronger affinity for lime salts than for anything else. Ammonia is produced in the breath; it produces spongy gums and soft and porous salivary calculus. Carbonic acid keeps the lime in solution; heat drives off the carbonic acid, and the lime is precipitated. He had been represented as teaching that caries was wholly chemical, in spite of the care he had taken to say that vitality always modifies chemical action. There are four varieties of decay, and many crosses.

Dr. Morgan. Is impressed with the importance of the idea that disease leaves its impress upon the tissues. Whatever interferes with nutrition impairs the dentine. This shows the importance of the utmost care in respect to the temporary teeth. If they are interfered with so as to arrest the development of the permanent, lasting injury is done.

Prof. Judd. We need something more than we had fifteen or twenty years ago to explain carious action. He has never felt satisfied with any of these theories, but had been in hopes of a better. With regard to the vital theory, one fact is to be considered. Extract a tooth, and reinsert its crown in the mouth, and a carious cavity will occur. He does not deny that the vital force exerts some influence, but in view of the above fact it cannot be the governing principle. The acids of the mouth have a great influence, but carious cavities are not produced by immersing teeth in acids. There is a general effect produced, but no cavities. Is satisfied that *one* agent has been discovered,—the parasite. There are few microscopists in this country capable of examining this subject; but we have the evidence of the best microscopists that parasitic germs exist. How do they act? I cannot tell. Some claim that there is a distention

of the dentinal tubuli; this may be; or it may be that they exercise an immediate influence on the soft tissues. Again, it has been surmised that the parasites increase the acidity, and this is a very probable theory.

Dr. Spelman. The acid theory is an accepted one, but does not account for decay. Parasites assist to dilute the fluids, and prevent destruction. Fungous growths prevent motion and dilution. The parasitic theory is being discarded.

Prof. McQuillen was surprised that any one should deny the existence of parasites in carious cavities. He had not only seen them, but watched their movements over and again for hours. As to their causing decay, that is another question. A gentleman claimed last year in the Southern Dental Association to have seen parasites with formidable boring apparatus, by which they worked their way through the enamel and dentine, but we are yet in doubt as to the nature and character of these parasites,—whether they are vegetable or animal. The majority of investigators claim that they are vegetable. Whatever the other causes at work may be, we cannot deny the action of acids in the production of decay. When it is asserted that vitality controls chemical action, it seems to me that those who assert it do not understand what is meant by vitality, or the correlation of chemical and vital force. Instead of chemical affinities being controlled by vitality, there is no vital action possible without the incessant and complicated actions of chemical affinities; all the molecular changes of composition and decomposition occurring in the living body —nutrition secretion, and motion—depend on chemical actions. Vitality does not prevent the destructive action of an external chemical agent, it only repairs its ravages. Dip a dead man's finger in nitric, muriatic, or sulphuric acid, and the cuticle will be destroyed never to be replaced; subject the finger of a live man to the same treatment, and the vital action will restore the lost tissue.

Dr. Atkinson. Vitality in its fullest extent includes all other kinds of action. Chemical action is a department of

vital action. It is pitiable that men will have the hardihood to open their mouths before this body and not know the thinnest skim-milk significance of the terms they use. One speaker says that parasites have nothing to do with it, and then gives us the description of a parasite. Enamel is one of the differential tissues of the body. The first cell must have been calcified in order to constitute it enamel at all. We cannot transpose the natural serial order. What is the use of talking about dissolving enamel that never existed? When vitality is least, resistance is greatest; and where it is highest there are more doors to let in Peter and Paul and kick up a bobbery in the household. If the elements are perfectly saturated, they are married for life; there is no free love; and if they are not satisfied (as we would say of men and women,) you had better look out how you let visitors into the family. You can never get enamel tissue till you have a magma to set it on by the proliferation of the stellate cells that are the base of the rods of enamel. We are mere beginners, and must speak alphabetically. Teeth with more enamel material than is necessary are found to have little pearls at the bifurcation of the roots. People are cultured that are developed in society, and the rule is as good in molecules as in men. When the bonds of affinity are satisfied, we have a permanent tissue. Enamel is an example of crystalline structure; dentine is a compromise. Calling teeth dead is nonsense; they are not dead so long as they hold connection with the system. In teeth out of the mouth, black decay cannot be produced except through a long series of alternating experiments. All decay is affected by solution. Enamel grows upon a basis of dentine, and when full-formed it is next to impossible to affect it in the mouth except by abrasion, because the other tissues will feel the attack so much as to notify the owner.

Prof. Taft. In decay of the teeth, the best organic structure possesses the highest manifestation of vital principle, and in consequence best resists decay. If the life

principle is removed, the tissue disintegrates and falls to pieces. As the life-force is toned up and vigorous, it will resist.

A committee, consisting of Drs. Bogue, Taft and Shepard, was appointed to prepare resolutions on the death of Prof. Hitchcock.

The report of the Committee on Dental Chemistry was called for, and was read by Prof. H. A. Smith.

The report stated that the year had not been prolific in investigation in this department, but such investigation requires special training, severe study, means, and leisure, and we congratulate ourselves that so many practical applications of discoveries have been made. Apparently valueless ones should not be judged hastily; they may be of great importance. Practical applications are not generally made by discoverers; witness chloroform, discovered by Liebig in 1834, and applied by Simpson long after, and nitrous oxide, discovered by Davy and applied by Wells to anæsthesia.

The report then alluded to the translation from the French by Prof. Judd of a paper on Dental Tartar, by Dr. Vergue, and commended it as valuable to the student.

Prof. Chase had once read a paper before this body, claiming that human saliva was acid or neutral; but this experimenter stated that it was alkaline, considering that the acidity was the result of admixture with other substances in the mouth. Tartar was then described; its different colors attributed to different agents; and an analysis of it given, from which it appeared that the phosphate of lime is found in much greater quantity in the tartar of the incisor teeth, and the phosphate of iron predominates in the molar. The author concludes that tartar is produced by a change in the gingivo-dental deposit, by which it is decomposed; and that it is formed uniformly upon each tooth, but mechanically collects at two points.

The report then referred to a series of experiments by Dr. G. V. Black, of Illinois, as to the causes of the various

colors observed in decay. The fact is noted that all decomposing animal matter is darkened in color. This was stated to be owing to sulphuretted hydrogen, which precipitates any metals present, forming sulphurets, some of which are black and insoluble. That the same causes produce the colors in decayed teeth is highly probable. The decomposing pulp blocks the tubuli, and the sulphurets turn in dark. The sulphurets of iron may be formed from the blood. The experiments to sustain this theory were, in brief, a solution of a tooth in hydrochloric acid, forming a colorless solution; sulphuretted hydrogen gas was then passed through the solution, which changed it to a yellowish color; and the tooth itself (which was immersed) was also changed to a color corresponding to the light yellow of decay. The solution being neutralized by soda, the color grew dark, and finally black, as the reaction became alkaline. By varying these experiments all the colors of decay were produced.

Some further experiments by Dr. Black were described, showing the effects of acids in motion upon the teeth. An apparatus was devised, causing an acid solution to move constantly; two sound teeth placed obliquely in the current were cut gradually away, beginning at the cusps; a groove was also cut between the teeth. On the third day this had extended into the dentine. On the sixth day the crowns were going to pieces. It was noticeable that the cutting was least upon the surface placed fairly against the current, and most where it broke around the tooth. A tooth immersed in the same solution, but without motion, showed only the usual slight softening. Dr. Black is convinced that this will prove to be the true explanation of decay.

The report then adverted to the action of the coloring matter in vulcanite upon the mouth, and its effects upon the health. There are two opinions; the minority think it highly injurious; while the majority claim that it is inert. Vermilion is six parts of mercury to one of sulphur, and forms thirty-six per cent. of the whole mass of rubber. It is insoluble except in nitro-muriatic acid. The tendency to

"flower," or appear in minute globules, may, by the globules being liberated by friction on the plate, and the decomposing action of light, free a small quantity of mercury, which being introduced into the stomach in a finely-divided state might be acted upon by the acids there present and the active chlorides of the metal produced. Some varieties are adulterated with arsenic, etc., to which the deleterious effects may be due. In such cases, however, it should be ascertained whether mercury has not recently been taken. It may indeed stay a long time in the system, and then suddenly manifest itself after taking, for example the iodide of potassium.

The difference of opinion on this subject reflected little credit upon a body claiming to practice on scientific principles. If the compound is injurious, it is our duty to abandon it. The association should institute an investigation.

Dr. Shepard gave notice of an amendment to the constitution, giving the Executive Committee the power to change the place selected for regular meetings for extraordinary reasons. Laid over till next year. Adjourned.

The afternoon session was dispensed with, to admit of the attendance of the association *en masse* upon an excursion provided by the liberality of the dentists of Detroit. A steamer was chartered for a trip down the Detroit River to Grosse Isle, a journey of an hour or more. At the island where a retired hotel afforded a quiet and inviting retreat, a collation was served, to which ample justice was done by the party; and in a short time they were again embarked and on the "home stretch." The beautiful scenery along the bank, the enlivening strains discoursed by a fine military band, together with social intercourse, rendered the whole affair an exceedingly enjoyable and pleasant one. A landing being effected, the excursionists marched in procession directly to the hall and at once organized for the

Evening Session.

The subject of "Dental Chemistry" was passed, and "Therapeutics" called, but no member of the committee

was present. "Dental Etiology" was then called, and a report read by Dr. M. H. Webb. We give the following synopsis:

Etiology is the science of causes; dental etiology, the causes of processes destructive to the dental tissues. During the formative process, there may be deficient nutrition, or there may be an interruption of nutrition by reason of disease, either of which results in insufficient density or permanent defects of structure. Teeth bear the impress of hereditary disease. The etiology of dental caries embraces imperfect tooth-structure; insufficient calcification of the enamel prisms, incomplete coalescence of the prisms, too great interglobular spaces; and fissures in bicuspids and molars. Certain conditions favor the production of acids as well as of parasites, which Lieber and Rottenstein regard as having much to do with caries. Wedl says it is at least accelerated by them. The former experimenters obtained with dilute acids results identical with those of Westcott, Allport, and others, but did not succeed in imitating caries. Lactic acid is most abundant in the mouth, though various other acids are found. They need not be strong to separate the carbonic acid from the lime. Enamel is normally translucent, dentine opaque; but when attacked by acids, the former becomes opaque while the latter becomes translucent. After the dissolution of enamel, the leptothrix penetrates deeply into the dentine and tubuli, which become enlarged, even in superficial caries; beds of leptothrix are found in uncleansed places. Acids and leptothrix may be reasonably inferred to penetrate the dentine and accelerate disintegration. If caries be superficial, it may be arrested by the removal of the decayed portions, but if the dentine is involved, it cannot be determined when the leptothrix are eradicated,—and if they are not, caries will probably recur; acids favor the proliferation of the parasites. When decomposed material is allowed to remain at the bottom of cavities, the fungi perish or may be destroyed by carbolic acid. When dentine is attacked it is best to excavate and

fill, rather than cut away and obliterate the decay Calcareous deposits sometimes fill the tubuli, known as secondary dentine; Magitot, as well as Lieber and Rottenstein, believed them to spring from the pulp; Mr. Tomes considers it probable that this is deficient in vitality, and this view is favored by its want of sensitiveness. Acids will also attack this, notwithstanding the barriers erected by nature. Polished surfaces are merely the mechanical result of mastication. Salivary calculus causes absorption of the alveoli. The salts of the saliva are precipitated and deposited upon the teeth, and leptothrix, leucocytes, etc., are embodied in masses of this substance. Where it exists, decay is least active, and vice versa. The sublingual secretions are alkaline, while that of the parotid is acid; when it becomes alkaline, the salts are precipitated. When the secretions are decidedly alkaline, the salts are dissolved instead of precipitated, and caries proceeds with vigor; the pulp is reached, and the whole train of dental diseases—odontalgia, abscess, and sometimes consequent necrosis—ensues.

After the reading of this paper, the subject was deferred till the remaining reports should be read. "Operative Dentistry" was then called for, and a report read by Dr. Shepard.

The report mentioned as among the improvements in this department which has made rapid strides during a year or two past, machinery for operations upon the teeth. It has met a universal want, and though when used without judgment causes the loss of valuable tooth tissue, is yet indispensable. Two things are yet wanting to perfect it, an automatic motor, and a means of stopping and starting the bur suddenly in the mouth. The first is necessasy because no nervous force can be spared to drive the machine. Electricity has been tried, and cannot be regarded as a success. Steam has objections, but they may be overcome. The simple idea of its use will tend to prevent its general employment. Several water-motors have been invented, two of which were mentioned as being applicable; also a

spring-motor, which is contained in a box a foot square, and can be used anywhere.

The report then alluded to the fact that a few years ago the tendency was to the use of heavy mallets, and that more recently there has been a tendency in the opposite direction, which by some has been carried to the extent of simply rubbing down the foil with the slightest pressure. Ivory points had been recommended, but had not proved a success. Very hard steel points were also recommended, and were claimed to be less dangerous to fragile walls; also a plugger, with a point consisting of a serrated wheel, designed for use after some progress has been made in the filling; this is agreeable to the tired patient and to the tooth sore from malleting. Fisk's saliva ejector was spoken of and recommended. The use of platina foil was mentioned, and recommended for restoring contour, the color being more agreeable than gold. A new preparation of amalgam in pellets was also mentioned favorably.

The report then adverted to the discussion as to the comparative merits of cohesive and non cohesive foil, and referred to the experiments made by Fletcher, of England. Similar ones made in this country have proved that tight fillings can be made with cohesive gold; poor ones are made with it as well as with all other materials. But have we not used too much cohesive gold to save the largest number of teeth for the largest number of patients? A reaction is sure to come; many of the most active and progressive men have been seeking it out in quiet; and the foil-makers sell more of soft and less of cohesive. Rubber dam and cohesive gold are the greatest discoveries of the century in our art,—all honor to their discoverers,—no man can do first-class work without these articles. Our meetings, literatures, and clinics show how they are appreciated. Of late, however, the question, how best to serve the patient with the least expenditure of time and suffering, is forcing itself forward. The interests of the patient are paramount to those of the profession, and we

sometimes lose sight of this and proceed as if he had no rights. Filling teeth is a longer and more painful operation than formerly. Is this necessary to save them? We ought to devise some way in which good, cheap dentistry may be placed within reach of the masses. Every unnecessary moment spent is a fraud upon the patient. The tendency has been to this extreme, and it is high time that some one should champion the sufferers. We have run mad upon cohesive gold, rubber dam, and the mallet, and have abused them shamefully. We are divided into three classes: the enthusiasts, trying all new things, and casting aside the old —among these are found some of the world's benefactors; the old fogies are at the other extreme; they are safe men, but of little benefit so far as advancement is concerned, and of little influence with the profession. The other class is the mean between these extremes; they investigate, await results, and form the jury whose verdict stands the test of time. The general practitioner should enroll himself among this middle class. Cohesive foil should be used only when it is necessary to have strength. Why put our patients to the expense of time and pain except in these cases? To apply the dam takes time, and is painful; when the tooth can be filled without it its use is injudicious and unkind, and keeps patients away, from their fear of it. The writer uses it less than he did five years ago. It is unnecessary in four-fifths of medium crown cavities, labial cavities in incisors, even under the gum, and in many proximal cavities Have the crown fillings of ten or twenty years ago failed. Our much vaunted progress has not been all upward. There are many teeth which a regard for the interests of the patient require to be filled with other material than gold. Tin in crown cavities not having antagonists, as well as in many proximal cavities, is recommended. It is of low conductivity, and is antiseptic. Gutta-percha is a most valuable filling for buccal cavities of molars, and for children's incisors. These two should be used instead of the ton and a half of amalgam now used yearly.

The subject being open,

Dr. Southworth said that the amalgam pellets, as prepared, are extremely dry, and difficulty will be experienced in their use by those accustomed to the ordinary article, which is about half mercury. The pellets have but two-fifths. Where the dam is difficult to apply without using wedges, use a little toilet soap upon the teeth, and have no further difficulty.

Dr. Crouse takes many exceptions to the report. It accuses operators using machinery of cutting away too much. This is not generally true; the failure is the other way, according to his observation, ever since we have had machinery. The electric machine *is* a success; has none to sell, but will stand up for it. There might be an improvement, however, in it; and one, as to stopping the bur, has already been made. Agrees with the paper as to the use of soft foil. Never used cohesive universally. If the report means by soft foil partially cohesive foil, will agree with it; this is more easily adapted than very cohesive. For contour fillings, uses Nos. 60, 120, or 20. Hand-pressure should be used more than it is, especially in chalky teeth, which must not be battered at the edges. The report advocates tin foil where there is no antagonist. It takes but little more time or expense to fill with gold; then why not use it? It will be a good thing when we come to the time when we can fill teeth rapidly and well, so as to bring dentistry within the reach of the masses. The dam causes very little pain, takes little time, and is pleasanter than napkins, and you can see your cavity and work with ease and confidence.

Dr. Morgan protests against the use of the terms soft and hard foil, as used. The softest foil is the most adhesive.

Dr. Wetherbee. The report is incomplete, in not mentioning filling roots or removing salivary calculus. He enters his caveat against the statement that labial or buccal cavities can be as well filled without as with the dam. The gum will be wounded and will bleed; the gold is liable to

come in contact with it. The patient is not incommoded by thin rubber and fine twine. The majority of patients will prefer a clean piece of rubber to a napkin under the lip. In cavities under the gum an instrument is carried through the hole and below the margin of the cavity, and held by an assistant, and the twine is carried up carefully and tied. You now finish the excavation, and go on with your filling, which can be finished off without lacerating the gum. Some cavities may be filled with pellets without the dam, but they must be small to be successful. Formerly had written against the mallet, unfortunately, but tried it, and found himself not so tired, and not one patient in ten objected. He had dispensed with the light mallet, and used a lead one of five and a half ounces, and found a less number of devitalized teeth giving trouble. He was a convert to the mallet, and rejoiced that it was introduced. For root-filling it has been claimed that oxychloride and Hill's stopping are as good as gold. Few have studied the subject so carefully as to determine this; gold is superior to either under all circumstances. It may be more difficult, but the head and hands should be educated to the task. A professional man should know no defeat where it is possible for intelligence to gain the day. Gold can be carried with certainty where oxychloride, etc., cannot. The subject of salivary calculus has been neglected. We should be diligent in our search for it. It is doing serious injury, and there are no suitable instruments found among the profession for its thorough removal. We should battle early and long for the faithful removal of this substance, even to the ends of the roots of the molars. Proper instruments can be, and have been, constructed.

Dr. Thomas expressed his approbation in the main of the report. We are really in advance of the past, perhaps, in a hundred-fold ratio. If the report was analyzed, all would agree with it. Has seen the folly of a great deal of this progressing operating. Would not throw a wet blanket upon progression, but we should stop and consider what we

are doing. Five years ago would have declared that any man that did not use cohesive foil was behind the age; but when he sees fillings of twenty to forty years' standing still doing well, he stops and considers whether it is justifiable to throw aside all of the old ways and accept all of the new. The middle ground would be more safe. Every one thinks the appliances he has used are the best. It is dangerous ground to denounce old things without a thorough investigation. Agrees with the paper that too much has been cut away; also with Dr. Crouse, when he says that we are at fault in not cutting away enough. We should pursue a happy medium in order to produce the best results.

An informal clinic was appointed for the next morning, with Drs. Webb, Butler, and Ambler as operators.

Adjourned.

TO BE CONTINUED.

ARTICLE V.

On the Condition of the Mouth and Teeth During Pregnancy.

BY MR. OAKLEY COLES.

Mr. President and Gentlemen:—There is an old-fashioned phrase, common amongst a large section of the female community,—"for every child a tooth."

I believe that the accuracy of the statement contained in this old woman's fable may be fairly doubted, but it is nevertheless true, that the period of pregnancy is one in which the oral secretions are subject to considerable alterations, whilst the teeth are peculiarly liable at this time to decay, or to undergo pathological changes.

In the artificial life of the present day, the teeth are less able to resist the strain made upon them, in common with the other parts of the organism; hence we have during pregnancy an increasing liability to caries with each generation.

The interest of the subject, rather than my own qualification for writing on it, must be my excuse for treating of a matter in connection with which I would sooner have listened to some older members of this Society.

I propose in the following paper noticing—

1. The changes and general condition of the teeth during pregnancy.
2. The condition of the gums.
3. The oral secretions, with their changes and influence upon the teeth.
4. The neuralgia of pregnancy.

And lastly, the remedial agents useful during pregnancy.

1. *The changes and general condition of the teeth during pregnancy.*—In a large number of cases the period of pregnancy passes by in a perfectly normal condition, the processes that take place are physiological, and no evidence is given (in the mouth, at any rate) of any pathological process having occurred. In other instances we find the first few months of pregnancy accompanied with a severe toothache. This is usually (if it be a first pregnancy) attributable to neuralgia, and not to odontalgia. I shall therefore speak of it further on.

When the pain arises from the teeth, we generally find them the subjects of caries, though not always. The one variety that I have found most prevalent is the brown caries. The teeth are discolored over most of their surface, and the margin of the cavity of decay is black, and beyond the margin, a shading of brown from almost black to a stone color, spreads over the surface of the tooth adjoining the carious part. In the upper incisors and canines there is generally a line of green discoloration on the labial surface of the tooth, following the crescentic outline of the gum, or, in place of the green coloring matter, a dark line of blackish-brown, looking as if the enamel had been charred with a hot iron. The enamel is opaque in appearance and brittle to the touch.

As a rule, the upper and lower bicuspids will be seen in various stages of decay, the lateral incisors of the upper jaw

standing next in liabity to caries, and then the central incisors; the lower incisors, as a rule, escape, as under ordinary circumstances, apart from pregnancy.

The women of the lower classes seem more liable to this special description of caries during and subsequently to pregnancy than those of the middle and upper sections of the community.

A second variety that is very interesting, but comparatively rarely seen, is where decay takes place on the prominences of the palatine cusps of the upper bicuspids and molars. The cavity presents a ragged margin, and does not generally give rise to pain, since its existence is soon noticed by the tongue of the patient, and relief sought for at the hands of the dental surgeon. The dentine is found softened, but not much discolored, nor is the enamel changed in appearance, beyond the opacity surrounding the outline of the cavity.

We shall see the special interest attaching to this peculiarity of situation when speaking of the etiology of caries during pregnancy.

There is still a third description of decay requiring a few words of reference, and that is the soft caries.

Near the margins of the gum and around the necks of the teeth the enamel seems either to have disappeared or to have become so softened in texture, that a sharp excavator or enamel chisel easily passes through it: the teeth are very often exquisitively sensitive and conscious of every thermal change. The removal of the softened tissue is an operation inflicting considerable pain, and it is very easy to go on cutting away till the pulp-cavity is nearly approached. Sometimes this softened state of the enamel and dentine is confined to a limited area, whilst in other instances it passes round the neck of the tooth like a ring. Whenever it is present, the enamel is generally less opaque in appearance than in the first variety of caries referred to, and there is, as a rule, no green or brown discoloration or deposit on the labial surface of the upper incisors.

All the teeth are liable to an attack of this process of disintegration; but the upper bicuspids, lower bicuspids and molars, and upper laterals and canines, seem somewhat more subject to it than the rest of the teeth. Such an observation, however, is but of small value unless extending over a large area of cases than one observer has the opportunity of seeing.

There is a modification of this last variety, in which we find a general softening of the tooth without any actual decay, as it is ordinarily understood. The whole tooth (most frequently in my own experience an upper bicuspid) becomes very sensitive to the touch. A draught of cold air gives severe pain, hot fluids taken into the mouth produce discomfort, and occasionally even an instrument covered with cotton wool, or the touch of a linen napkin, will give a severe shock to the patient's nerves. Later on, in the history of such a case, we find the tooth more loosened from its socekt, and at last it becomes a source of so much irritation to the patient, that even within a few weeks of her accouchment, she prefers undergoing the pain of extraction to the constant plague of an aching tooth.

Although we have loosening, there ts no great elongation or, to speak more correctly, protrusion from the socket, and we find that the loosening has been partly due to the absorption of the alveolus that has taken place. On removing the tooth, the periosteum of the fang is seen to be scanty in substance and anæmic in appearance. The tooth can be cut through easily with the excising forceps or hand-saw; and on examining the pulp, even with an ordinary magnifying-glass, and pressing it between the finger and thumb, we are able to observe its fatty condition, unmistakably distinguishable from the ordinary healthy or inflamed pulp.

The cut portion of the tooth has also a greasy surface, very different to that which is felt with any tooth after extraction for inflamed pulp or periosteum with alveolar abscess. We have, I believe, a condition that may be fairly and scientifically called " fatty degeneration "

Although, so far as I am aware, this pathological process has not hitherto been associated with the pregnant state, still it is one that has been fully recognized and described in connection with senile and other forms of decay, by Professor Wedl ("Dental Pathology," pp. 233, 241, 415.)

Thus, in treating the affections of the pulp he writes:—"Fatty degeneration is of frequent occurrence, and is manifested in a general way by its diminished volume and succulency, its recession and pale reddish discoloration, with a trace of yellow. * * * In some parts, the fat-globules form chainlike or fusiform aggregations, and follow the course of the vessels and nerves; in others the minute fat-molecules are scattered in the interstitial connective tissue, which may be cleared up by the addition of acetic acid or carbonate of soda. * * * The pulps of milk-teeth also, while the latter are undergoing resorption during the period of dentition, and really are senescent teeth, sometimes become the subjects of the above fatty degenerations, which occur in the same manner and form as with the subsequent teeth." Writing again of atrophy of the pulp, he states:—"The highest grade is displayed in the degeneration of the pulp into a soft greasy mass, unaccompanied by the odor of composition. * * * A tooth which has been the subject of a total decay of this description is no longer firmly attached within its alveolus." He says:—"It is a familiar fact, that dead animal tissues undergo a marked fatty degeneration under certain circumstances; * * * fat may also be deposited in dead dentine; indeed it is found interposed in the dentinal canals in the form of drops."

There is, however, another explanation that may be offered for the softening that takes place in otherwise sound teeth, during pregnancy, and that is either a diminution in the supply of earthy salts, to repair the waste of constant use, or an actual resorption of the calcareous constituents of the teeth, such as takes place during the progress of osteomalacia. Osteo-malacia is a disease peculiar to women,

and generally connected with the pregnant or puerperal state, and it is quite possible that the condition of the teeth that we have under consideration may be due to a modification of such a pathological process. This hypothesis is further strengthened by the fact, that in some cases softening takes place without any appearanee of fatty degeneration.

It is somewhat singular, though I think it is capable of explanation, that "soft or white caries," with softening and loosening of the teeth unaffected with caries, is more commonly found amongst the upper classes, and those who have the reputation of being well nourished, than amongst the poor and lower middle class. It is perhaps desirable to mention, before leaving this part of the subject, that teeth that have been plugged before pregnancy are as frequently the seat of caries as others ; and, moreover, we not unfrequently find that the margins of a cavity will have given way, leaving the plug standing alone, and only held in position by its deeply placed retaining points.

2. *The Conditions of the Gums.*—It may be well to state at once that, so far as my observations have gone, I have failed to discover any condition of the gums that can be regarded as specially and alone connected with the pregnant state. Whilst, therefore, speaking of those changes that take place in the gums, we must bear in mind that their appearance is due to the influences that are in operation at other times than during pregnancy, and that beyond the fact of their coincidence, they would call for no special attention.

"When the teeth are the subject of brown caries, "with green deposit on their crowns, and tartar around the necks and fangs, we generally find the margin of the gum raised, glistening and distended; immediately below the margin there is a well defined reddish-purple line; occasionally this is of so deep a purple tint that it has been mistaken for a symptom of lead poisoning; at other times we find midway between the margin of the gum and the purple line an

intermediate space covered with cast-off epithelial cells. The surface of the gum is hot and painful to the touch, and bleeds readily. The affection is not confined to any special part of the dental margins, but is nevertheless most severe in the incisive region of both the upper and lower jaw.

In other cases we find the gums of a rather full color, with their margins rounded, but not very much thickened; they are, however, separated from their attachment to the necks of the lower teeth (the incisors, canines, and bicuspids especially,) and on pressing gently from below upwards, on the anterior surface of the gum, a thin fluid, and very often pus, is seen to ooze from around the neck of the tooth and free border of the gum.

This condition is not confined to those who are negligent in the care of their teeth, but will also be found in mouths where the tooth brush is used both freely and frequently.

We have here, doubtless, a state of passive congestion owing to impeded circulation, in the course of which a serous or corpuscular transudation takes place through the walls of the distended veins.

Associated (most frequently) with white caries, or softening and loosening of the teeth, we have an anæmic condition of the gums. Here, instead of the margins being thick and rounded, they are thin, pale and shriveled in appearance, withdrawn from the necks of the teeth, yet still adherent at a higher point of attachment; not unfrequently there is seen a prominent ridge a little beyond the free border, and this is sometimes of a deeper tint than the surrounding membrane. If any condition of the gums could be said to be especially associated with pregnancy, it would be that which I have just described, more especially as it is notably present in cases of frequently-recurring pregnancy.

3. *The Oral Secretions, with their Changes and Influence upon the Teeth.* —The changes that take place in the oral and buccal secretions are probably the most potent agents in the production of caries during pregnancy. The secre

tion of saliva is increased to a great extent, in many cases by irritation of the second and third branches of the fifth pair of nerves, and also by a stimulation derived from the acrid eructions of the stomach and the morning sickness during the early months of pregnancy.

Test papers, applied early in the morning, will determine the acidity of the contents of the mouth in a large majority of the cases examined, especially in first pregnancies; later in the day it is difficult to obtain data by means of test papers that are of any value, since there are many agencies at work tending to counteract (if present) the acidity of the saliva. Patients will tell you that during their first two pregnancies (in most cases) they awake with an acid taste in the mouth, and after the sickness that usually occurs, the acidity in the mouth is much more pronounced, whilst the vomited matter is so acid in its character, that, even after standing for a considerable time, or if treated at once, by the addition of a little carbonate of soda or potash, a free liberation of carbonic acid takes place.

Before the sickness the secretion of the saliva and mucus is generally increased, and the flow continues under the influence of the acid principle arising from the stomach.

From the recent investigations that have been made, there can be little doubt, I think, that the most fruitful source of the excessive flow of saliva is the acid matter regurgitated from the stomach, which undoubtedly possesses the power of stimulating the salivary glands. This is a point of great interest in relation to the origin of caries; I must, therefore, enter into the matter more fully than might at a first thought seem needful.

Dr. Sidney Ringer, in his "Handbook of Therapeutics" (p. 78,) says:—"It has been fully established by repeated and careful experiments, that dilute acids, when taken into the stomach, possess the power to check its secretion; while on the other hand, alkalies stand prominent among the most powerful exciters of the secretion of the gastric juice. From these facts the more general law has been inferred—

namely, that acids possess the power to check the production of acid secretions from glands, while they increase the flow of alkaline ones, while the very reverse is the case with alkalies, which are supposed to check alkaline but to increase acid secretions. This general law (says the author) is made the more probable, as it fully explains the effects, which experience has shown to be true, of acids on the secretions of the alimentary canal in disease."

We see from the foregoing extract that there is more than one way in which to account both for acidity of the stomach and increased flow of saliva. The salivary secretion may arise from dental irritation or neuralgia; and I may here mention that this has its analogue in the increased secretion that flows from lachrymal glands when the opthalmic division of the fifth is the seat of irritation. This alkaline saliva being swallowed would increase the flow of the gastric fluids, whilst acrid eructations following, we have the salivary glands still further stimulated.—*Odontological Society of Great Britain Transactions.*

TO BE CONTINUED.

ARTICLE VI.

Cicatricial Contractions from Burns, Involving the Face

BY GURDON BUCK, M. D.

H. C. W., æt. four years and seven months, resident of New Jersey, of sound constitution and enjoying good health, was extensively burned when sixteen months old by over turning upon himself a kerosene study lamp. At the expiration of about fourteen months the burnt surfaces had mostly healed. The parts involved in the cicatricial contractions which resulted from the burns were the left half of the face and scalp, and the dorsal surface of the left hand and forearm. When I first examined him, in February, 1872, his condition was as follows.—The left half of the scalp, as far

back as the occipital region, was bare, and the surface presented a pale, shining, cicatricial aspect ; the skin, however, was pliable, and moved freely on the underlying parts. The left ear, though diminished in size by the loss of its rim, retained its natural shape, and was not adherent to the scalp. The skin covering the left half of the forehead and temple, though cicatricial on its surface, was still movable on the subjacent parts. The outer half of the left upper eyelid was everted to an extreme degree, and spread out upon the eyebrow ; the inner half of its tarsal border alone came into contact with the lower lid. The conjunction covering the everted portion of the lid being relaxed and swollen, filled up the space between the lids when closed, and thus protected cornea, which otherwise would have become opaque from constant exposure. The eye-lashes, as well as the tarsal edges of both lids, had escaped injury. The eyebrow was denuded of hair. The eyeball itself had sustained no damage, the cornea retaining its natural lustre, and vision being unimpaired. The surface of the left cheek and side of the nose was cicatricial, and the contraction consequent thereupon had drawn the underlid away from contact with the eyeball, but without producing any eversion of its tarsal margin. The left angle of the mouth was somewhat drawn upward by a vertical fold of cicatricial skin upon the cheek immediately above it. In consequence of the condition of the lids of the left eye, patient habitually held his head inclined forward and to the left side, so as to avoid direct exposure to bright light, and had thereby acquired a peculiar expression of countenance. A description of the left hand and forearm will be reserved to a subsequent part of the narrative.

On the 6th of February, 1872, an operation was performed in the presence of Dr. James A. Davis, the family physician, from Bloomfield, New Jersey, Drs. John Beekman and Thomas Satterthwaite, and Prof. A. C. Post, M. D.

First Operation.—The object of this operation was to restore the upper lid of the left eye to its normal relations

and functions. It was attempted as follows:—Two incisions were started from a single point high up on the forehead, above the middle of the left eyebrow, and continued downward in lines diverging from each other and terminating, one at either canthus of the eye. The inverted V-shaped patch of skin, included between these incisions, was dissected up from the pericranium as low down as the bony margin of the orbit. The upper lid was thus liberated and brought down so as to allow its tarsal margin to be adjusted in contact with that of the underlid. Before proceeding further, a transverse fold of the redundant conjunctiva, lining the upper lid, was excised as far back from its tarsal margin as possible. With the descent of the upper lid, the inverted V-shaped patch of skin, which had been raised from the forehead, was brought down and secured at a lower level by a pin suture inserted on either side, together with additional thread sutures above the pin sutures. The surface left bare on the forehead by the descent of the patch was closed by approximating the opposite edges of the wound, and securing them in contact by thread sutures. To relieve these last sutures from tension, parallel incisions were made through the skin on either side, the one over the left temple being three inches, while the other, toward the middle of the forehead, was only one inch in length. The edges of these incisions yawned wide apart, and the desired relief was thus obtained. The bare surfaces left were coated with a collodion crust, formed by applying, first, a layer of dry lint, and then over it a second layer of lint saturated with collodion, which soon stiffens and adheres closely to the surrounding surface. In order to hold the tarsal edges of the lids more exactly in coaptation, a beaded silver-wire clamp suture was passed in a vertical direction through both lids towards the outer canthus, and out of the way of the cornea, and left in situ for three days. Wet dressings were avoided, and a layer of woven lint of double thickness was kept applied to the parts. Moderate febrile reaction followed the operation, but subsided on the third day. On

the fourth day the last sutures were removed. Sloughing, however, had already taken place, and had involved about three-fifths of the transplanted patch. Healthy suppuration succeeded the separation of the sloughs, and the ulcerated surface progressively diminished in size. The collodion crust separated from the forehead on the sixth day, and from the left temple on the tenth, leaving healthy granulating surfaces to heal by cicitrization. The eyeball had in no way suffered from the presence of the silver wire which traversed the lids. Patient rapidly regained his spirits, and at the end of one week resumed his accustomed amusements, enjoyed his meals, and rested well at night. The sloughing which had taken place was no doubt to be attributed to the cicatricial condition of the transplanted patch of skin. The ulcerated surface above the left eyebrow progressively diminished in size, and at the end of the fourth week measured one inch in its transverse diameter, by three-fourths of an inch vertically. If left to itself it was feared that the contraction consequent upon cicatrization might produce, to a greater or less degree, the original eversion of the upper lid. To prevent this it was determined to transfer a portion of sound skin from the right half of the forehead and engraft it upon the ulcerated surface. The operation for accomplishing this object was performed on the 8th of March.

Second Operation.—The ulcerated spot itself was prepared by first excising the granulating surface down to the level of the pericranium, with scissors, applied flatwise, and then paring afresh the edges, and everting them slightly. A transverse incision was then carried across the forehead, on a line continuous with the lower margin of the spot just prepared, and as far as the inner extremity of the right eyebrow. The upper edge of this incision was dissected up to afford a bare surface of one finger's breadth, which would be continuous with and form a part of the space above the eyebrow. A pattern, cut from oiled silk, of the size and shape of the space just prepared, was applied upon the right of the forehead, in a vertical position, with its base resting

upon the inner half of the eyebrow, and its free extremity involving the hairy scalp above, which had been previously shaved clean. An incision was then carried around the margin of the pattern, and the included underlying patch of skin was dissected up from the pericranium, but left connected, for support, at the margin of the orbit. The pedicle of the patch, at its inner edge, toward the median line, was adjacent to the bare surface which it was intended to cover. Additional room had to be made for the transfer of the patch, by dissecting up the skin from the forehead, above the nose, and displacing it toward the left side, where it remained attached, and was reserved for subsequent use. The patch was now brought down edgewise from right to left, and adjusted accurately to the edges of the space prepared for it, with sutures inserted close together. In order to utilize the portion of skin displaced from above the nose, for the purpose of covering the surface left bare on the right half of the forehead, it was carried upward from left to right and adjusted to the lower part of the bare surface by means of sutures. The remaining upper portion of the bare surface was coated over with a collodion crust, and left to heal by granulation. Before proceeding to the operation just described, a transverse fold was excised, for the second time, from the still redundant conjunctival lining of the upper lid, and the lids themselves were secured together by a single thread suture inserted through the skin alone, near their tarsal edges, and toward the outer canthus. A strip of woven lint, saturated with collodion, was applied across the outer half of the closed lids, to afford additional support. The entire operation occupied one hour and a half, and was well borne, the loss of blood having been inconsiderable. A layer of woven lint, of double thickness, was spread with cerate, to prevent its sticking to the surface, and laid upon the forehead. Elixir opii, gutt. x., and weak brandy and water were directed. March 10.—*Second day.*—Slight febrile reaction and moderate inflammatory tumefaction. Removed three pins and changed the yarn on the remain-

ing ones. 12th.—*Fourth day.*—All the sutures have been removed in succession, including the one holding the lids in contact. To supply the place of this last suture strips of adhesive plaster were applied. Primary union has taken place at almost all points, and with any sloughing. 20th. —*Twelfth day.*—The collodion crust came off from the forehead, exposing healthy granulations at the circumference of the sore, but in the centre a brownish patch of sloughing pericranium, which had been unintentionally divided in the operation. No exfoliation of bone, however, followed the sloughing of the pericranium ; healthy granulations covered the spot, and cicatrization followed. Iron and quinine were ordered as a tonic.

Third Operation.—The patient being in excellent condition, from a stay of three weeks in the country, a third operation was performed on the 20th April, for the purpose of removing a conspicuous distortion of the left angle of the mouth. An incision, commencing at a point on the left cheek, bordering on the middle of the nose, was carried downward and outward across the cheek to a point a little anterior to the angle of the jaw. In its course the incision divided the cicatricial fold which distorted the angle of the mouth, and so allowed the latter to regain its natural shape. The edges of the incision, after having been dissected up, receded from each other and left a space between them of about one finger's breadth. To fill this up with sound skin, the following method was adopted: A patch of skin of the required shape and size was dissected up from the side of the neck below the edge of the jaw, its free extremity being below the symphysis, and its pedicile of attachment adjoining the space to be filled up. This patch was then transferred edgewise to its new locality, and then accurately adjusted by sutures. The wound left on the neck was closed by approximating its opposite edges, and securing them together with sutures. The treatment was the same as after the previous operations. Union failed to take place, and sloughing of about three-fifths of the patch followed.

On the fourth day the slough separated, and healthy suppuration succeeded. It was now important to prevent shrinking of what remained of the patch, and to maintain it in place. This was done by adhesive straps carefully adapted and frequently removed. April 25—A mild attack of erysipelas developed itself upon the left ear and neighboring surface of the scalp, but soon passed off without any serious consequences. From this time his general health improved, and cicatrization of all the sore surfaces progressed steadily till June 8th, when all had finally healed. The result of the last operation, notwithstanding the loss of so large a portion of the transplanted patch of skin, was not without some improvement of the angle of the mouth. As no further operations would be undertaken till the autumn, patient's nurse was instructed to manipulate the parts upon the forehead and left cheek daily, so as to increase their pliability and prevent contraction from taking place. The good effect of these manipulations was manifest when patient returned in October to spend the winter in the city with his family.—*Medical Record.*

EDITORIAL. ETC.

Virginia State Dental Association.—The Fifth Annual Session of this Association will be held in the city of Richmond, commencing December 15th, at 10 o'clock A. M. All members of the profession are cordially invited to attend. The Secretary of this Association is Geo. F. Keesee, D. D. S.

Celluloid.—Dr. Eames expresses his opinion of this substance, as *now* manufactured, as follows: "He made a thorough test of the celluloid when it was first offered to the profession, and soon after published a report unfavorable to it. He found it unfitted for the purpose of a base, on account of its liability to change of form, by shrinkage and warping, the great amount of free camphor in some of the material, and the flasky condition of the plates. He believed from what he had learned of the manufacture of this material, that these difficulties in the way of its use had been mainly overcome, and that celluloid, as now made, was worthy a trial at least. The reasons assigned for the defects in the plates as first made were these: They were made from gun cotton, prepared for the use of photographers; that when subjected to the action of the solvent camphor, a portion of it would be converted into glucose, another portion remaining cotton fiber. These three products, the result of imperfectly prepared cotton, worked together into a plate, must, of necessity, give unsatisfactory results.

The material is now made from the flax fiber, it being first worked into thin paper, then subjected to the action of acids of tested strength, and for a given time, which gives uniform results, and this product, subjected to the action of camphor, gives one result, celluloid. Has made several plates from this new material lately, and thus far is much pleased with them. With the new steam apparatus, it is more easily manufactured than the rubber. Can be repaired in the same manner as the rubber, by moistening the surfaces, when a union of two pieces is desired, with a solution of camphor."

The Cause of so Many Failures.—Dr. Black, speaking on this subject, says:

"There is one cause of failure to which men practicing in in country-towns are most subject, and that is that they are often undertaking operations which they can not get the time to properly complete. In bi-cuspids or molars, with pulps dead and roots filled, decayed deep in proximal surfaces, the retaining pits should be well in from the margin; if too near the margin it is almost impossible to avoid failure; should start at

the retaining pits and gradually approach the margin, building up a thick sheet of gold so that it may not curl up and leave the margin under the blows of the mallet—causing failure."

OBITUARY.

DR. GEORGE E HAWES.—A meeting of dentists, called at a few hours notice on Tuesday afternoon, (on receipt of the news of the death of DR. GEORGE E. HAWES, of New York City, at Wrentham, Mass.,) was held at the residence of J. G. Ambler, No. 25 West 23d Street, N. Y., August 25th, who presented the following preamble and resolutions, which were unamimously adopted.

Whereas, An all-wise Providence has seen fit to remove by death our much esteemed friend and professional brother DR. GEORGE E. HAWES, of this city, therefore

Resolved, That while we bow in humble submission to the decrees of Him who doeth all things well, we cannot refrain from expressing our feelings of sadness and sorrow at the loss our profession has sustained in the demise of our much esteemed friend and brother.

Resolved, That we show our affections and appreciation for his many virtues and bright examples by placing on record these expressions of our bereavement and sorrow.

Resolved, That our sympathies true and heartfelt, are hereby tendered to the family and friends of the deceased, as well as the profession at large in this dispensation of Providence. Though we lament his death, we cannot be unconscious that our loss is his gain.

Resolved, That a committee be appointed by the chair to prepare a suitable memorial for publication in the dental and medical journals.

Resolved, That these proceedings be published in the *New York Times* and the *Observer*, also a copy sent to the family of deceased.

(Signed,) JOHN ALLEN, *Chairman*.

J. G. AMBLER, *Secretary*.

Committee on Memorial.—J. G. Ambler, John Allen, W. H. Atkinson, J. Parmly, L. Coville.

MEMORIAL OF DR. GEORGE E. HAWES.

Dr. George E. Hawes, the subject of this brief memorial, was born at Wrentham, Massachusetts, May 28th, 1810. His Father, Col. George Hawes, was a man of integrity and uprightness; whose patriotism was of an active character in our revolutionary struggles, he filling his place in the ranks of the Colonial patriots, battling against aggressive and oppressive acts of the Mother country, and subsequently serving the State in its Halls of Legislation. His mother still survives him at the advanced age of ninety-five years; having laid all the members of her immediate family in the resting place of the dead. Dr. Hawes commenced his preparatory course as a Dentist in the office of the late Dr. John Lovejoy, and after completing his course of study with him, he commenced the practice of his profession in Park Place, and after years of diligent and successful practice, he located in Bond Street, where he continued his professional career until laid aside by impaired health.

He was an eminently successful Dentist, retaining the confidence of his patients by the perfection of his operations, and his uniform urbanity. By the members of the Dental profession, he was universally esteemed, his opinions on difficult cases in practice were appreciated because they were judicious and sound, and there are none who knew him that do not feel that a safe operator has been lost by the community, and an appreciated and safe counsellor by the profession. We shall miss his acquaintance and counsel. Dr. Hawes, was a *Christian Gentleman*, and to appreciate him, it was only necessary to have his acquaintance. The family who survive him, have, in the recollection of the past, and in the assurance of his blessed future, all the consolation necessary to assuage their grief and make supportable their great bereavement.

(Signed,) J. G. AMBLER,

On behalf of Committee.

MONTHLY SUMMARY.

Local Use of Chloral.—In the Atlanta *Med and Surg. Journal*, Dr. E. M. Nolan gives this case:—

"A few months ago a lady at her catamenial period requested relief from a very distressing and painful headache. I dissolved fifteen or twenty grains of chloral in very little water, and with the tip of one finger rubbed it upon one of her temples until she could very sensibly feel the burning, and until the skin was reddened. The part rubbed was not larger than a silver dollar, but when I ceased the pain was entirely relieved and remained so. I have used it in this manner many times since, in ordinary nervous headache, and have never been disappointed, save one time, and then the patient was partially relieved. I sometimes rub one temple, and sometimes both, according to the effect desired. There is no inconvenience from the application. The surface turns slightly red, and feels a little sore upon being touched, for two or three days. There is a slight desquamation of the epidermis, and soon there is no sign left of the application."

Cutting Teeth.—It was a peculiarity of this baby to be always cutting teeth. Whether they never came, or whether they came and went away again, is not in evidence; but it had certainly cut enough, on the showing of Mrs. Tetterby, to make a handsome dental provision for the sign of the Bull and Mouth. All sorts of objects were impressed for the rubbing of its gums, nothwithstanding that it always carried, dangling at its waist (which was immediately under its chin,) a bone ring, large enough to have represented the rosary of a large nun. Knife-handles, umbrella-tops, the heads of walking sticks selected from the stock, the fingers of the family in general, but especially of Johnny, nutmeg-grater, crusts, the handles of doors, and the cool knobs on the tops of pokers, were among the commonest instruments indiscriminately applied for this baby's relief. The amount of electricity that must have been rubbed out of its gums in a week, is not to be calculated. Still Mrs. Tetterby always said "it was coming through, and then the child would be herself," and still it never did come through, so the child continued to be somebody else.—*Christmas Stories.*

Lead as a Constituent of Enamel the Cause of Chronic Poisoning.—The patient, a corpulent man, 36 years of age, suffered at one time from a severe attack of tvphlitis. From this, however, he had recovered some time, when he began to complain of intense pain in the abdomen, and was considerably emaciated in a short time. His face became yellow and he continued to suffer from fulness and pain over the cæcal region, and shooting pains through the breast and stomach. Percussion over the abdomen was dull, sleep and appetite disturbed; pulse and temperature were normal. At first typhlitis was suspected, and a dose of castor-oil administered, after which a passage was obtained. The fæces consisted of large boggy masses. The stomach became reduced in size, but the pain still continued, extending over the back and through the extremities. The stomach was tense and contracted, and on applying pressure the pain was *not* increased but vomiting was produced almost instantly, consisting of green masses. The bowels were very constipated, and only moved when a drastic cathartic was administered. After four weeks had elapsed, a slate-colored band made its appearance on the gums, and bladder-tenesmus became apparent Upon this appearance a diagnosis of lead poisoning was arrived at. Soon after this the sister of the patient was similarly attacked.

The source of the lead poisoning was shortly afterward detected. The jar used as a receptacle for vinegar was found to be much corroded, and nearly all the enamel was removed by the vinegar. The vinegar possessed disagreeable sweetish taste. One "schoppen" was placed in the jar for ten hours, when on examination 0.09 grm. of metallic lead were found. The jar, when full of vinegar, must have contained, after standing ten hours, 1.8 grm., and after standing one week must have contained 30.24 grms. of lead in solution. About one jar of vinegar was consumed per day, which was quite sufficient to produce lead poisoning in the family.—*Med. Record.*

How to Insert the Hypodermic Syringe.—Prof. Hildebrandt, of Königsberg, says in the *American Journal of Obstetrics*:—

In performing the injection I take up a firm fold of skin and insert the canula of the syringe perpendicularly (not obliquely) into the crest of the fold, to the depth of one-half the length of the canula, in order that the fluid may always enter the thick, adipose, subcutaneous cellular tissue. I believe that it is owing to this circumstance alone that I have never had occasion to see an abscess. As a rule, only the first three to five injections are painful: subsequently they are more and more easily borne. A slight subcutaneous infiltration (*hautknoten*) always remains, in some women only several days, in others many days, and even weeks.—*Med. and Surg. Reporter.*

Arsenic Poisoning by a Green Carpet.—At a recent meeting of the Swedish Medical Society of Stockholm, Dr. Kjellberg related the case of a young man, who, having manifested symptoms of arsenic poisoning, was sent away to travel. During the following year, he enjoyed perfect health, but having at length returned home, he began to suffer, shortly after, in the same manner as before. Suspicion was now directed to a green carpet upon the floor of his chamber and an analysis revealed the fact that there was contained in the coloring matter a very considerable quantity of arsenic. The removal of this carpet was followed by an immediate disappearance of all the morbid symptoms.—*Hygiea, Stockholm.*

How to Deprive Iodine of its Stain.—Add a few drops of phenic acid to the tincture, and it will not stain ; moreover, the tincture is more efficacious, and its action more certain. M. Bogs recommends the following formula for use in injections ; Alcoholic tincture of iodine, three grm : phenic acid, six drops ; glycerine, 30 grm ; distilled water, 150 grm. This preparation is superior to all others in the treatment of blennorrhagia and leucorrhœa.—*Med. and Surg. Reporter.*

The Prevention of Dental Caries.—Dr. Flagg, in the *Dental Cosmos*, states that he has found repeatedly the most beneficial effects produced by the administration of medicines which, used locally in the seemingly accepted method of experiment, would be disastrous in the extreme ; for example nitro-muriatic acid will be recognized as eminently destructive of tooth-tissue. He has not seen a case of dental carfes which he could attribute to the use of any acid medicine, while he has again and again seen remarkably prompt cessation of dental tenderness and tendency to caries, resulting from local weakness of tooth-structure consequent upon long-continued biliary difficulty, from the administration of fifteen to twenty drops of nitro-muriatic acid daily.

Monobromide of Camphor.—Dr. Bournville, of the Paris School of Medicine, strongly advocates the therapeutical employment of this compound in cases of delirium tremens, epilepsy, hysteria, infantile, convulsions (due to the irritation of teething,) chorea, paralysis agitans, etc. He gives the results of numerous interesting experiments, and also the histories of various cases treated successfully. In hydrophobia tetanus, and epilepsy, he recommends a solution of the monobromide in alcohol and glycerine to be injected under the skin.

The formula for this substance is $C^{10} HO^{16}$ Br.—*Med. and Surg. Reporter.*

To Suppress Hemorrhage in the Mouth during Operations.—Professor Andrews, of Chicago, (*Med Examiner,*) advises, when hemorrhage interferes with operations in the mouth, to use the atomizer with ether, after etherization by inhalation if the latter should be deemed necessary. He says that it does not interfere with the operation, that it restrains bleeding, and that the inhalation of the vapor from the spray keeps up a sufficient degree of anæsthesia.

Electricity in Vomiting.—This method succeeded admirably in controlling vomiting in the practice of Bellevue Hospital (*Med. Record.*) In the vomiting of puerperal fever it had answered well. The positive pole is placed over the pit of the stomach. The strength of the current is varied according to circumstances.—*Pacific Med. & Surg. Journal.*

Death from Chloroform.—At Boston, on Saturday, October 3d, in the case of Linscott, who died in a dentist's chair from the inhalation of chloroform, the coroner's jury declared themselves of the opinion that, with our present knowledge of chloroform, its use as an anæsthetic is wholly unjustifiable, and they recommended the passage of a law forbidding its administration.—*Med. & Surg. Reporter.*

Physical Peculiarities of Negroes.—Dr. A. W. McDowell publishes, in the *American Practitioner*, some observations on this subject which contain some facts that are new to us. The negro's want of power of resisting disease was abundantly shown in the late war. Dr. McDowell states that the fine chests frequently seen among the males are due solely to the great development of the pectoral muscles, and that the lungs are decidedly less in weight than those of white men. The liver on the other hand is larger. He goes on to say, "The negro's lower bowel was smaller. The colored troops were much troubled with constipation, often requiring purgatives, while at the same time and place the white troops had diarrhœa. The most marked difference existed between the spleen of the black and that of the white, the former only weighing half as much as the latter. 'Ague cake' was one of the sequelæ of malarial disease observed among the whites, but not among the blacks." In his army practice, the author weighed the brain at every *post mortem*, and found that its weight increased in direct ratio to the admixture of Caucasian blood.

To Arrest Hemorrhage of the Mouth and Gums.—Dr. Q. C. Smith writes to *Pacific Med. and Surg. Journal* as follows:

Take fine flour, a sufficient quantity, and work into it balsam of fir to the consistence of thin smooth dough. Then take equal parts of powdered kino and catechu, a sufficient quantity and work it into the dough until it is quite stiff. Roll into masses as large as convenient for introducing into the mouth, and use as many as are necessary to pack the mouth tightly when the patient's mouth is closed, so that every part from which hemorrhage issues may be closely compressed by the medicated mass, to get the mechanical as well as chemical effect of the remedy. Renew the application as often as the mass becomes softened by the saliva so as to render it ineffectual.

We have used this remedy in the way just described in a number of cases, with complete success, after persulphate and pernitrate of iron, and other more or less vaunted styptics had failed to serve any good purposes.

"*Nothing New Under the Sun.*—Doctor Mordtmann, of Constantinople, publishes, in the *Gazette Medicale de l'Orient*, some curious details he had discovered in some old Oriental chronicles tending to show that the Siamese twins, as well as the sisters Milly and Christine, had prototypes in former times. According to these Byzantine chronicles, there came from Armenia to Constantinople in the year 744, a monster, consisting of two children born of one mother. These children were attached to one another at the epigastrium, so that they faced each other, the other parts of their bodies being regularly formed. During their sojourn in the Byzantine capital numbers flocked to see this monstrosity; but as the twins were superstitiously regarded by the ecclesiastical authorities as being of bad augury, they were expelled the city, to return again when a comparatively enlightened emperor ascended the throne of the Cæsars. One of these twins died, and one of the most skillful physicians endeavored to divide the survivor from the corpse at the point of juncture, in the hope of saving his life. The operation, however, only served to prolong its duration for three days.—*The London Medical Record.*

Lancing the Gums.—Dr. James Finlayson concludes a paper in the *British Medical Journal* (Sept. 19, 1874) on the alleged dangers of dentition, and the practice of lancing the gums, with the statement that the chief danger of the wholesale use of the gum-lancet lies in its embodying in practice a theoretical view of the ailment, and so tending to close the mind against further inquiry into the diagnosis, etiology and treatment of infantile disorders.

Directions for Escaping Colds.—The observations of Raventhal have shown the existence of a central heat-producing power, and an external radiating surface. A rise or fall of temperature is due to a disturbance of the balance existing normally between these two antagonistic areas. An increase of the heat-producing area may produce fever; or this may be due to a diminution of the cooling processes. The reverse of this leads to a lowering of the body temperature, or to a "chill." The leading article of *British Medical Journal*, April 11, 1874. presents an admirable description of "how colds are caught." As a sequence of these and the above facts the following practical considerations are deduced, which should be written in letters of gold over the door of every house: [*a*] Never wear wet clothes after active muscular exertion has ceased, but change them at once. [*b*] Meet the loss of body heat by warm fluids and dry clothes. [*c*] Avoid long sustained loss of heat which is not met by increased production of heat. [*d*] Increase the tonicity of the cutaneous vessels by cold baths, etc., so as to educate them to contract readily on exposure. [*e*] Avoid warm and debilitating rooms and temperatures. [*f*] Take special care against too great loss of heat when the skin is glowing. [*g*] Prevent the inspiration of cold air by the mouth by breathing through the nose. Old people and children, the anæmic and convalescent, bear cold badly, and hence should carefully observe the above means for escaping colds.—*Detroit Review of Medicine and Surgery.*

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ARTICLE I.

Anæsthesia.

BY DR. E. F. BUNNELL.

Read before the California State Dental Association.

The subject of Anæsthesia, both local and general, is one that to a great extent has occupied the minds of surgeons and dentists for many years.

The word anæsthesia indicates an agent that renders a person insensible to pain. It is not my expectation to advance any new ideas upon the subject; it is one that should be, and I presume is, familiar, to you all. My object is simply to induce a discussion upon the merits of the most general articles used by our profession, in order to lead to the adoption of the one that, all things considered, will produce the desired result with the least danger to our patients. It is a subject of great and grave importance to those who are called upon almost daily to perform operations more or less painful, the thought of which produces an unconquerable horror in the minds of very many persons who apply to us for relief. I shall therefore speak of the

three substances known as chloroform, sulphuric ether and nitrous oxide. The latter substance, manufactured in a crude form and administered in an imperfect way, was noticed by "Sir Humphrey Davy" about the year 1800; after many experiments he predicted its eventual use for the prevention of pain in surgical operations. To "Horace Wells," a dentist, belongs the credit of verifying this prediction, although its extended use is of comparatively recent date.

No doubt it has, in some cases been greatly abused, in consequence of the imperfection in the apparatus for generating and administering the gas. It has been asserted that it may be used with perfect impunity in all cases, even if the patient is suffering from disease of heart, lungs, or from *any* organic disease. I consider this to be an attempt to prove too much for any substance that will produce perfect anæsthesia. Although the gas is purely oxygen and nitrogen, the element of the air we breathe, yet we are aware that there is great difference between a *mixture* of these elements and a chemical combination.

With this combination it is necessary to exclude atmospheric air—with chloroform and ether this is not admissible, for without air respiration could not be sustained. But as respiration is fully sustained during the administration of nitrous oxide, it proves it to be more nearly normal to atmospheric air. There is doubtless a tendency of blood to the head to some extent during its inhalation. I would therefore consider it unsafe, the same as I would chloroform and ether, where there is a tendency or predisposition to apoplexy or inflammation of the brain.

It has been considered to be one of the laws or effects of stimulation that it is always followed by a corresponding or proportionate depression. This is undoubtedly the case with chloroform and ether, but is not so with nitrous oxide.

The preparation of the gas is very simple, with proper apparatus and proper caution; I would always use a double valve inhaler, attached by a hose of large caliber, directly to

the reservoir of gas, so that a free large column may pass directly to the patient. In this way the respiration is free, whereas if the column of gas is small the respiration is more or less labored. An inhaler, with a mouth-piece in the center to pass between the teeth, leaves the mouth open for the operation when anæsthesia is complete.

Now let us examine the components of this substance. It contains only those of atmospheric air, nitrogen and oxygen, chemically combined—the air in its natural state being a *mixture* of nitrogen by weight 76.99, oxygen by weight 23.10, by volume 79.20 and 20.80. By chemical combination of these elements, the proportion is changed to an atmosphere about once and a half the weight of air, and contains nitrogen 63.6 per cent., oxyen 36.4 per cent., or in chemical notation, atoms 1 and 1—equivalent nitrogen 14, oxygen 8.

Anæsthesia is supposed to be produced with it, by supply ing the system with carbon more rapidly than it can be eliminated. The patient passes quickly into a perfect state of anæsthesia, which is always plainly indicated. The con dition is of shorter duration than that produced by chloroform or ether. The functions of the body are slightly exalted, and respiration fully supported. After the lapse of from two to five minutes, the patient is in as perfectly a normal condition as before inhaling it. It is generally believed that any substance that produces immunity from pain is followed by a corresponding penalty. This I believe is not the case with nitrous oxide, but we all know it to be more or less so when chloroform or ether is inhaled. We can only judge of the merits of each by actual experiment upon a great variety of temperaments and conditions, considering also the component parts of each and their general effects. It has been asserted that the gas effects only the nerves of motion, and that the patient suffers all the pain without the ability to move. In some cases this may be so. It is equally true that the reverse is more generally the case, the sensory nerves being affected to a greater extent

than the motor nerves; the former may occur from one of two reasons anly—if the gas is impure, or deteriorated by the admission of atmospheric air, that condition may occur.

That many fatal results have followed the inhalation of chloroform, no one pretends to deny. It will not do for us to say that we have administered it many thousand times without accident or detriment to our patients, for we may not be aware of the condition produced by its administration upon the nervous system, whereby the health may be impaired for life.

Again it is a well established fact that persons have inhaled it many times with apparent impunity, and death has been finally produced before perfect anæsthesia has been obtained, and this too when no reasonable cause should be assigned. Statistics show us that these results have more frequently happened with persons in perfect health, so far as relates to any organic disease, than otherwise. In a table published in the *New York Journal of Medicine*, about the year 1864, it is stated that three died instantly, two in a minute, ten in from two to ten minutes, one in a quarter of an hour, one in half an hour, one in three hours, and the remainder in periods varying slightly from those above mentioned, to the number of thirty-three. Up to that date the recorded list of fatal results ascribed to chloroform amounted in the aggregate to more than one hundred. Now taking it for granted that we are willing to take the chances of producing death during an operation, what have we to fear beyond this?

Chloroform—or properly, ter-chloride of fomyl—contains 12 parts carbon, 1 part hydrogen, and 10.5 parts chlorine. When inhaled it is rapidly transformed in the blood, producing *formic acid*, which acts upon it as a poison; and having a strong affinity for the blood, it may remain in the circulation sufficiently long to produce effects upon the system which may and often do prove highly injurious. One thing is certain, the poison is transmitted to the circuation, and if anæsthesia is produced, it is no matter by

whom or how carefully it is administered, the poison must be there.

Chloroform was discovered by Samuel Guthrie, of Sackets Harbor, N. Y. Its chemical constituents were ascertained by "Dumas" in 1834. In its general influence it is sedative primarily to the nervous system; and secondarily, to respiration and circulation. It is absorbed by the blood and has been detected both in the blood and tissues after death. If pushed beyond the stage of comma and complete muscular relaxation, respiration becomes diminished, the pulse feeble, the face livid; finally respiration ceases, and also the heart's action—death being the result. When a very small quantity has been inhaled, death has been known to ensue by local paralysis of the heart, and in some cases respiration has continued after the heart has ceased to beat.

In regard to the after effects of the two substances—chloroform and ether—although the latter as well as the former produces languor, attended often with nausea and other disagreeable consequences, sometimes lasting for days, I would assuredly give the preference to ether. The component parts of the latter are: 24 parts carbon, 8 parts oxygen, and 5 parts hydrogen. When inhaled, it is decom posed in the system, forming *acetic acid* in the circulation, which is neutralized or passes off by after breathing, leaving no injurious substance in the blood.

During the administration of nitrous oxide, it has been suggested that the purple appearance of the lips indicate a tendency to asphyxia. This cannot be true, for the reason that *respiration* is fully supported.

Statistics recently collated by Professor E. Andrews, published in the *Chicago Medical Examiner*, gives the following estimate of the relative danger in the administration of different anæsthetics; in 200,893 cases, viz:

Sulph. ether, one death in 23,204 administrations.

Chloroform, one death in 2,723 administrations.

Mixed chloroform and ether, one death in 5,588 administrations.

Bi-chloride of methylene, one death in 7,000 administrations.

Nitrous Oxide, no deaths in 75,000 administrations.

I do not wish to be understood to favor anæsthetics of any kind, to be used generally in our practice; yet I believe there are cases where it is admissible to use other than local anæsthetics. I believe these cases are few, and that proper discrimination should be made when they are used. I simply desire to give the preference over chloroform and ether to nitrous oxide, when either is admissible.

N. B.—Some portions of the foregoing I do not claim to be original, they having been taken from publications that have appeared upon the subject; I have used such as best express my views.

ARTICLE II.

Extraction of Teeth.

BY DR. EATON.

Read before the California State Dental Association.

The subject selected, "The Extraction of Teeth," is one that has not been written on or discussed by this Society in former years, perhaps because every member was supposed to know all about the *modus operandi*, and partly for the lack of anything new or novel, either in the way of instruments or methods of using them, for some time past. Notwithstanding that to be able to extract understandingly, requires an accurate knowledge of the shapes and peculiarities of the different teeth, as well as the surrounding tissues. It has not been many years since the common practice was to remove all teeth that were troublesome, from whatever cause. At the present time, a dentist would not be considered worthy of the name should he consent to perform such an operation, if there was a reasonable probability of saving the offending member by a course of treatment, or until the patient was fully informed of the chances, and still insisted on its removal. In the treatment of diseased and

aching teeth, there has been wonderful advances made in the right direction, especially on this coast, since the State Dental Association has been organized, and there is still room for improvement. Those that are farthest advanced in the profession are the ones who are most anxious to learn, and most willing to impart their knowledge to others. This is as it should be, and I am sure there is not a member of this Association that has not been benefited and repaid many times over for all the inconveniences and loss of time sustained by attending. One great reason why more diseased teeth are not successfully treated in the country is that a large number of patients have been told by traveling quacks, that after a tooth once aches the quicker it is extracted the better; such an one, if persuaded to allow you to make an application to destroy a nerve, for instance with instructions to return in twenty-four hours, many times will not be seen again for weeks; and perhaps, would not come then if the tooth had not become sore and troublesome again, and they want it filled as you informed them it probably could be when you first saw the case. This time you are not so hopeful of success, as it may require several dressings before being in a condition to fill, and the result many times is, that the tooth is finally lost more through the patient's fault than yours; but you have all the blame to bear, and he is only strengthened in his opinion, held from the first, and would be indignant should the fee be more than for the simple extraction. Before anything is done, every case presented should be carefully examined, in order to ascertain as much as possible the circumstances and surroundings that might affect the operation, so that a correct conclusion may be formed of the number and inclination of the roots, and the probable amount of force that will be required for their removal; also satisfy yourself which tooth is the real cause of the trouble, for many times the patient will locate the pain in the wrong one, that perhaps stands in contact, and may be affected to some extent, but which will cease to trouble on the removal of its

diseased neighbor. The manner of operating is also of importance, as well as the selection of a proper forcep. I shall always remember the frantic efforts of an old dentist in the East, some ten years ago, in whose office I had just been employed as assistant: A gentleman took a seat in the chair, and wished a superior molar extracted; the proprietor selected a forcep, grasped the tooth, shut his eyes, and then began such a series of jerks and pulls as I never saw equalled; which continued until he was tired completely out; when he asked me to take a pull at it, as he had lost his grip entirely. Having come directly from an office where I had had the benefit of five years' instruction with a very cool and sure operator, I had no trouble in breaking up the attachment by giving it the usual outward and inward motion. Much mischief is often done by such nervous operators, and accidents of a serious character occur, such as fractures of the alveolus and sometimes the maxilla causing permanent deformity. A description of forceps suitable for extracting the various sizes and shapes of teeth, would be out of place here, a great deal depending on being accustomed to an instrument, and one that would come handy to me might be awkward to another. The great point is to have a good variety of different shapes and sizes so that no trouble will be experienced in selecting one that will fit nicely any case that may present itself; then, after lancing the gum well, in such cases as require it, secure a deep hold, and don't get excited. Prof. Taft says: "A very good criterion is that the eye should critically follow, and the mind attentively comprehend every movement of the hand and instrument." The forcep is considered by most operators the best and safest; but there are many cases where elevators, screws, hooks, etc., are of great assistance. The key is still used by some good operators; but having had no experience except as a patient, I am not prepared to say anything in its favor. To be able to extract well is a great help in securing patronage in other branches of our profession; for although it is usually one of

the easiest labors we have to perform, it is dreaded more than any other by our patients. I have known at least one dentist, who though no gentleman, and having but few warm friends, was sought for from far and near for his known skill in extracting. The indications for extracting are, in many cases, very plain to be seen at a glance. Temporary teeth that retain their place until the corresponding permanent ones appear, should always be removed; also temporary teeth that are in such a diseased condition as to do more harm than good if retained. I notice that Isaiah Forbes, D. D. S., in a paper on irregularities, advocates extracting all deciduous teeth that are presented which are badly decayed and aching, contending that the extraction of such teeth cannot possibly do any harm; but on the contrary, even though by an application we could alleviate the pain, their retention might injure the healthy growth of the permanent teeth. He says: "There is nothing so difficult to change as the impressions and prejudices of our early education. The more I have studied and reflected on this branch of the subject, the more have I become satisfied that the doctrine as taught in our dental text book cannot be correct. I also have the proud satisfaction of learning that Mr. Tomes, in his histological invetigations has come to the same conclusion." He goes on to illustrate by mentioning a case in his own family, and in a long argument makes a good showing in favor of his theory. This calls out in opposition, a long article from H. L. Sage, D. D. S.; which theory is best, time and investigation will no doubt bring forth. I have followed the method laid down in our text books, and endeavored to save the deciduous teeth as long as they could be retained, providing they are not in the way of the permanent ones. The matter of trying to save the first, or six year old molars, is another point of controversy on which much has been said both for and against. It seems to me that the Great Architect of the Universe must have placed them in their position, to be retained and made useful, as well as the twenty-eight remain-

ing ones. It certainly is a serious matter to the little folks when they have to submit to their extraction—all painful and diseased roots should be extracted. An incurable abscess is generally sufficient cause for extraction; or an abscess threatening to point on the outside of the face; also teeth that are so sore as to cause a continued avoidance of that side of the mouth in eating, if they cannot be cured should be removed.

Extracting for irregularities is sometimes necessary, but no rule can be laid down to govern such cases; great care and good judgment is requisite. In extracting for the insertion of artificial dentures it is often difficult to decide for the best, as to how many to remove, and how many to leave, and when our mind is once made up, it is often a hard matter to bring our patient to the same way of thinking.

In cases where a large number of teeth are badly decayed, so that the expense of saving them would be double or treble that of plate, we are often obliged to extract against our wishes. To quote the words of another: "How far we can go in urging the preservation of such teeth; how much we can do to strengthen faith in the permanence of fillings; how much we may dictate to our patients as to what they can or cannot afford, and how much charity we shall bestow to induce them to undertake the best plan, are questions which each must decide as best he can in each case; only let me plead that in each case the decision be made with a sincere desire to promote the best interests of the patient, and not on the basis of our own self interest.

SELECTED ARTICLES.

ARTICLE III.

American Dental Association.—CONTINUED.

THIRD DAY.—*Morning Session*.

Called to order at ten o'clock, President Buckingham in the chair.

Dr. Rehwinkel, chairman of the committee appointed last year to endeavor to procure the appointment of dental surgeons in the army and navy, reported that they had concluded that such proposed action was premature; the tendency of Congress is to cut down expenditures, and it was deemed expedient to let the matter rest for a time. The report was accepted, and the committee discharged.

The subject of "Operative Dentistry" being still open, Dr. Cushing said that at the meeting of this Association three years since, a paper was read on "Light *vs.* Heavy Foil," in which the author, Dr. Abbot, claimed to establish by experiment the fact that a given cavity would contain more foil of a light number than of heavy. He had felt confident that this conclusion could not be true, and that the experiments had not been fairly made; nor could they be so when performed by the same person, who was not an expert in the use of one method, while he was in another. He had therefore instituted some experiments with the same instrument. He had requested Dr. Allport, whose capabilities in packing soft foil would not be questioned, to fill the cavity in the steel plate twice; once with soft foil unannealed, and once with adhesive foil annealed. Dr. Allport had done so, packing the first with Abbey's No. 4 unan-

nealed, with hand pressure, which he designated as an "old fogy" filling; and the second with the same foil, annealed, packed with the mallet, in the usual way. The soft and adhesive foil fillings weighed exactly the same, seventeen and a half grains each.

The speaker had also made some fillings in the same cavity, with results as follows: No. 1, with Ashmead's No. 3 cohesive foil, small pellets, annealed as used, with fine pointed plugger, weight fifteen and a half grains. No. 2, Williams' rolled gold, No. 120, annealed as before, larger pointed instrument, weight nineteen and a half grains. The speaker submitted these experiments that a record might not go out from this Association that would lead to erroneous conclusions. For himself he preferred the heavier foils, and believes that in skillful hands they produce better results, on the whole, than lighter or soft; yet agrees with Dr. Allport that the quantity of gold in a cavity is not of so much importance as that it should be properly packed against the walls.

Dr. Butler thinks there is more time spent now on some classes of gold fillings than was demanded twenty years ago; an entirely different class of operations is now called for. If we spend more time, it is a necessity; many large fillings are now made that were not thought of a few years ago. People like fine things; there is a greater degree of refinement, and it runs through all their wants; they must go into luxuries as well as necessities, and fine fillings, even as far back as the third molar, are absolutely demanded. In the arts, fine productions must take time; a fine piece of work can be made into form quicker than it can be finished. It is the same with fillings.

As to rubber dam, why is thin the best? Thick is sometimes necessary, and causes no more pain. It is a mistake about wasting time putting it on; it is time saved. There is a certain class of patients for whom he could not be induced to operate, if he could not use rubber. In regard to root filling, it is hard to conceive how a substance that is

not plastic can be introduced as perfectly as a plastic material. If osteoplastic is carried in with the gold, it can be forced into every inequality more perfectly than gold. There is no rule for the kind of gold. Every one for himself on that question; but when restoration is attempted, cohesive must be used; but it is not certain that extra-cohesive will give good results. The walls are apt to be powdered. If soft foil were used, it could be made perfectly tight. He uses no higher number than 66; if confined to one preparation, would use Williams' No. 30.

Prof. Knapp. Is pleased with the report. It is easy to criticise; let those who do, try to make a better. Does not agree, however, as to the credit to which Dr. Arthur is entitled in the introduction of adhesive foil. Old members of the profession will remember that thirty years ago Leach made gold more adhesive than we have at present. There is far too much adhesive gold used to-day. He does not disparage but deprecates its indiscriminate use. It requires greater pressure, and soft is more safely used in frail teeth. It is not the amount of gold that is essential to preserve the teeth. It pleases the younger men to assert that fine work cannot be done without the dam, mallet, and adhesive foil; they are all good things in their place, but cavities on the labial surface have been excellently filled without the dam. Even cavities under the gum, unless extreme and bleeding, may be thoroughly filled and kept dry. When he sees skilled operators fail, he is led to inquire why we should put the patient to the expense of money and time necessary. If the cavity is properly prepared, and the gum treated two or three days, napkins would be sufficient. Rubber is not pleasant, and is carried to an unwarrantable extreme. Machinery is too frequently resorted to, especially by unskilled operators; too much is cut away; when the pulp is exposed there is great danger. Do we fill teeth to make jewelry, or to preserve them? They were preserved before adhesive gold or the mallet were used. The time, pain, and expense necessary do not warrant us in

using these things indiscriminately. Had known bad effects such as inflammation of the periosteum, from wedging and mallets.

Dr. John Allen said the report dealt fairly with the subject. We have great facilities at the present day, and the wonder is that as good work was made in old times as was made. As to the different methods, if our operations are good, it makes but little difference how we do them. Some will fail with soft foil, others with adhesive, and others will fail anyhow. The balance of testimony is in favor of soft gold. He can look back forty years and call to mind many fillings that are yet doing service. There are many outside of the profession who have aided us materially, and we should give them credit for the various manufactures and improvements in teeth, gold, and materials. Dental science is advancing, with the exception of the artificial branch; in that we have retrograded.

Dr. Keely thinks that, with heavy foil and the mallet, we can pack to frail walls with greater certainty, ten to one, than by hand pressure and soft foil, and can lap the gold over and protect the enamel. With the engine, heavy gold, mallet and dam, better operations are made. If every one asks blessings upon the head of the inventor of the dam as often as he does, he will be abundantly blessed.

Dr. Kulp said that he occupied a peculiar geographical position, and saw operations from all parts of the country. His opinion, based upon what he has seen, was that those who use the dam and the heroic practice of dressing out cavities, and heavy foil, are the ones whose fillings show the best. There is very little danger of cutting away too much. We vacillate too much, to-day using one thing, and to-morrow another. We should stick to one thing and have uniformity. Had tried all numbers, from 2 to 120, and uses numbers 4 and 60. In building up, uses large instrument and No. 4 foil, which takes much less time. The dam is less objectionable than the wedge.

Dr. Rehwinkel. All our arguments now seem to tend against the abuse of good things. The report gives a faith-

ful *resume* of the subject. Different modes must be left to individuals. Operations can be and have been done without the dam, but those who did them would not now do without it. They find themselves relieved of mental anxiety in filling. It has been said, in fact, that a great objection to rubber is the habit it produces of leaving the patient half an hour to converse with others in the next room. There are many in the profession who could not fill a tooth without rubber or adhesive foil. The preceptor does not do his duty who allows a student to go out without instruction in both. Any young man who will learn to fill well with soft foil, will soon learn to do so with cohesive. As to root filling, if an outsider were to come in here, what would he think? All the advocates of different modes claim ninety-nine cases out of a hundred. No one tells you that the condition of the tooth or system has anything to do with it. It is the *sine qua non.* Now (to Dr. Wetherbee,) you said that gold was the best under all circumstances; when you find it impossible to remove all the pulp, is gold the best for that case?

Dr. Wetherbee. I remove it entirely in incisors, cuspids, bicuspids, and molars, in from ten to twelve hours in all cases.

Dr. Rehwinkel. In every case?

Dr. Wetherbee. Yes, sir; in every case.

Dr. Rehwinkel. You have very funny people in Boston. (Laughter.)

Dr. Wetherbee. We have very sensible people there, and, beside, they have a dentist who knows his business! (Laughter and applause.)

Dr. Rehwinkel. He ought to add that the pulps of their teeth have sense enough to get out when they have no business there! People west of the Alleghanies are not so sensible, and their pulps stay as long as they can, and have to be removed by *hook and crook!* (Laughter and applause.)

Dr. Stockton. Teeth can be filled with each kind of foil that cannot be with the other. Uses an equal amount of

both soft and adhesive, finishing with heavy. Some teeth he can fill more quickly with soft foil. We must not have our hobbies. Instruments and appliances are so perfect that operations should not be defective. He had repeated the ink experiments of Fletcher, of England, with entirely different results, Dr. Osmond asserts that after a filling has been malleted tight, it may be malleted loose, and Fletcher probably committed that mistake. The condition of the tooth has something to do with the choice of material. If the walls are frail, would not use gold, as the walls will be broken up. You cannot build a good house on a poor foundation.

Dr. Bogue. Fletcher has recalled his statements, and admits that tight fillings can be made with adhesive foil. Dr. Kulp's experience is valuable. We do not realize the difference that exist in teeth and in individuals. Instead of becoming a degenerated race, we are absolutely improving. Such children as would formerly have died are now reared. The same is true with regard to teeth; they were formerly indiscriminately slaughtered. The old fillings we hear of are generally simple crown cavities. Such fillings as are now inserted were not in existence. Filling cavities is different from building up crowns. Soft foil and napkins and a little labor will do one, but not the other. He was glad to see a return to the easy ways, where they were effective.

Dr. Judd. The spirit of the report has not been touched upon. The idea was that our practice should be so modified as to afford operations at a less price, that numbers now unable could avail themselves of them. There are conditions about this in large cities; there is there a class of people able and willing to pay for the best operations, and they will be satisfied with nothing less; they will patronize those who do work according to their notions. There are other operators who spend less time and labor and skill, and they will be surrounded by another class of patients; and so down to the man who slips into the five-dollar establish-

ment for a set of teeth. Every grade is demanded. The country practitioner must fill all these requirements. The quick operator gets careless. The report was too conservative about the dam. It recommended the mean between two extremes, but in this case leaned from the median line. In long operations we should never dispense with it. Patients are glad of the rest it gives; confidence is given to the operator. Fletcher's experiments are not worthy of attention. The recommendation of tin, in large cavities, does not meet with his (the speaker's) full indorsement. It saves simply a small amount of gold. He does not sell gold for a living, but charges for his time and skill and experience. Soft gold works as easily as tin.

In some cases too many fissures are cut out, but many operators do not cut out enough. Fissures are natural in many cases. Recommends cutting out so far as there is any indication of decay, but it is time enough when decay shows itself. Believes in filling canals with gold; there is no better material. Is gratified that there has been no cotton advocated in this discussion; it is a mark of progress. As to the possibility of filling all roots to the apex with gold, it can't be done. Has examined many specimens, and in many instances no instrument can be carried to the apex. (Dr. Wetherbee here stated that he did not intend to claim that all canals could be filled to the apex with gold.) As to opening them up by drills, it was a perfect failure, as a general thing; the drill was apt to run out at the side, He had seen a cuspid so drilled by a dean of a dental college (so called.) He (the speaker) had filled it with oxychloride some years ago, and it was doing well. Is glad to hear a refutation of Dr. Abbott's experiments. We can fill teeth with adhesive foil and mallet, that are too frail to stand hand pressure. Many fine operators are very poor dentists. We have more disease from injudicious operations than from all other causes. Pulps seem to die more readily under amalgam than gold.

Prof. Shepard. The report has been misunderstood, but it has furnished a stimulus for discussion. The principle of

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it is this,—a great many people are poor, and are sufferers; the great majority of dentists must be dentists to these poor ones. To those who minister to the rich, the expense of material is nothing, but the dentist to the poor must get pay for $3 or $5 worth of gold. The dentist who gets $1 per cavity is just as respectable and just as much a benefactor as the one who gets $10. This point is too much ignored. Prominent men have been considered to be those who get high fees, and not those who do most good. This last should be the standard. Country dentists are in the majority. The main objections to the report have been in regard to omissions; but telling how this or that is done not properly come into this body. We would give credit to whom it is due; if Dr. Arthur had cared to take out a patent for adhesive gold in 1855, he could have done so, but he had published the thing abroad, and should have credit for it. It is almost impossible in college instruction to get students to care anything about learning to use soft foil or to fill a tooth without the dam. This is a great error.

Dr. McQuillen. The fees of a dentist do not give him reputation and position; it is the character of his operations. There is danger of cheap operations for the poor misapprehended. Some of the best operators in the cities are supplied from the country. The talent of the village seeks the city, to enjoy the fruits of a reputation made by performing good operations for a small compensation. The best work should be done under all circumstances. He was opposed to the practice of filling roots with cotton. With respect to fissures in the enamel, the finest probes should be used in making an examination of the teeth, and where such an instrument catches, the place should be cut into and filled. These fissures, microscopical in size, often lead to dentine in which the interglobular spaces are abundant, or otherwise defective in structure, and sometimes they open into cavities in which caries has accomplished its work of destruction without presenting any external evidence of the fact.

Dr. Judd explained that what he said was that there were fissures upon every molar tooth; they are natural, and a part of its anatomy, and unless there are indications of delay, it is not best to cut them out under all circumstances.

Dr. Allport. Had noticed the experiments of Fletcher. No doubt some operators can pack cohesive gold sufficiently well to preserve the teeth; but it is not what a few of the best operators can do; it is the kind of gold best adapted to the skill of the mass of operators that should be generally adopted. It is not necessary to have Fletcher's experiments to prove that cohesive gold fillings leak. One-half of all the cohesive foil fillings are discolored; they are beautiful but worthless. The old-fashioned fillings of Harris, Maynard, and others, though so soft that you can stick a plugger through them, are to-day absolutely preserving the teeth; they are scooped out, but are saving the teeth. Why? Because the material was better adapted to the average skill. In some cases cohesive gold is necessary; there is not the same danger of fracturing the walls of a frail tooth, because it is not driven directly against them; when it is used, however, you should pack soft gold against the walls. Cohesive gold is very deceptive; you think you have a beautiful filling, but it will fail with ordinary operators. Did not use the rubber for a good while, but now finds the places where it is most difficult to apply, the very places where it is wanted, and can hardly do without it. As to fissures, there are natural fissures with no presence of decay; you may catch your instrument in them, and at the same time find no decay. When the tooth is decayed, it is time enough to fill it; but if the teeth are soft, it is safe to anticipate it.

Dr. Bogue, chairman of the committee appointed for the purpose, reported the following memorial resolution, which was unanimously adopted:

Whereas, This Association has with sorrow learned of the death of Prof. Thomas B. Hitchcock, of the Harvard Dental School, one of our most valuable members, and the

chairman of the Committee on Histology and Microscopy; therefore,

Resolved, That we signify in this public manner our sense of the great loss which the profession and the cause of dental education have sustained, and that this resolution be inserted in the records, in the place where the report of the committee would have appeared.

Adjourned.

Afternoon Session.

The subject of "Operative Dentistry" still under discussion.

Dr. S. B. Palmer said that tin foil had antiseptic properties. There is a chemical or galvanic action between all the metals we put in the mouth, and even between gold and tooth-bone. Chemical and galvanic action are synonymous. It has been generally supposed that bone, not being a conductor, no action existed between it and the metals; but when the galvanometer is applied, it is found to be otherwise. He cracked a tooth and put it with gold into a dilute acid, and found that the tooth was being consumed. In an alkaline condition, the action is reversed. If the gold is pure, so much the worse for the tooth. The tin filling being in a loose porous condition, is itself consumed, while the tooth is preserved. For this reason, prefers it in the sixth-year molars, or in children's mouths, because it renders the tooth negative till it will stand the wear.

Dr. Walker. For operators outside of Boston, to remove all the nerve in every case is impossible. In root-filling it is not necessary to resist mechanical or chemical action but simply to use something that will occupy the space and has an antiseptic property. The fissures in the canals can be better filled with Guillois's cement than with gold. Uses it a little soft, and pushed up with cotton.

Prof. Knapp. In cases of bleeding after extraction, which are not controlled by the ordinary means, as in hem-

orrhagic diathesis, cut a plug of wood resembling the roots cutting a few creases in it, around which wind a little cotton saturated with the perchloride of iron. In this way the most obstinate hemorrhage is easily checked.

Dr. Atkinson. The bleeding, in such a case, is not from a hemorrhagic diathesis, but from a broken artery which is attached so that it cannot contract. All you have to do is simply to take a bur and give it one turn in the bottom of the socket, and kiss your patient good-by! Criticism is a two-edged sword; it is not fault-finding, but it is a test of truth. Admires the spirit of the report, and would only suggest that we give in such reports less of individual opinion, and more of principles. The mechanism of filling teeth has entered into this discussion more than the principles involved. At the cervical walls an immense preponderance of failures occurs. That is where we need the greatest care. What constitutes this? Keeping the cavity so that we can see. How anybody can fill under the gum satisfactorily without the dam, is at a loss to see. Cut away the excess of gum, instead of wedging back with cotton; drill a hole above the cavity and put in a screw, and hook the dam over it, and file and finish off the screw when you do the filing. Use whatever means pleases you, but, by all means do good work. He has not backslidden any farther than to go back to No. 30, since the introduction of heavy foil. It is a saving of time sometimes to be slow. Put on the rubber without getting excited. Only a small minority obey the law of contour; until that is done, there is no perfect dentistry. The teeth are analogue in their position to the staves of a barrel, and you cannot afford to lose one of them. Even the wisdom-teeth are proper abutments, and the breaking of the arch is where the mischief comes in. There is no difference of opinion about good cheap dentistry. Cheap is not low-priced; shoddy is not cheap. He has yet to see the first man that does not ask enough for what he does.

Dr. Webb. Instruments of almost every conceivable form, with the smooth, plain, or convex point, along through

various grades, of serrations, the broken point, and then the alloyed gold points,—all have been used and eulogized. The cohesive property of gold was recognized, and then too Dr. W. H. Atkinson introduced and advocated the mallet as a valuable aid in the impactation of the precious metal, and both were adopted.

To-day the cohesiveness of absolutely pure gold is deemed quite sufficient for all purposes as a filling, except that it is best to pass it through the flame of alcohol when the impactation is to be carried to a restoration of contour.

To-day, also, we have electricity applied as a force for the impactation of gold, and those who have used that representation of true genius—the improved electro-magnetic mallet—cannot but feel thankful to the inventor for it.

The lightning like blows impact gold to a greater degree of perfect solidity than has otherwise ever been accomplished.

Dr. Palmer asked how labial cavities were to be kept dry without the dam.

Dr. Shepard. Get everything ready on the table. Use a rope of bibulous paper under the lip. Don't allow closure of the mouth; use care not to wound the gum. Had filled such cavities which had failed under the best operators, and the patients stated that they had experienced less pain.

Prof. Taft. The preservation of the pulp is a very important matter, and one of the most difficult things a dentist is called upon to accomplish. He is sad and sorry to hear of destroying pulps—poisoning them to death. We must get over this impression. In many persons the destruction of the pulp is equivalent to the loss of the tooth, and under most favorable circumstances the loss of the pulp insures the loss or detriment of the tooth. Its course is onward to the destruction of the tooth, and this ought to be engraved with a pen of iron upon the mind of every dentist. A great many say they cannot save the pulp, but a great many do save them,—in almost all cases. Some fail, but what phy-

sician poisons his patients because he cannot save them all? We should recognize the importance of the organ, and save every pulp possible, and make an effort to save every one. How shall it be done? Pursue a rational treatment as with other tissues. Knowledge will enable us to know what to do. If the pulp is in a condition of comparative health, it should then be the aim simply to close it up. Cover it with some substance that will be acceptable to it, that will not decompose, will not produce pressure, and is a non-conductor,—seal it up, and all will be well, If it has been exposed or diseased, the treatment will depend upon the condition of the system. Dr. Rehwinkel says, in his neighborhood they have so much malaria that they have to take quinine by the ringing of the bell, and he can't save pulps in that locality. Systemic conditions must be recognized.

Dr. Thomas agrees with Prof. Taft as to the propriety of efforts to save every pulp. But what about teeth that we find remaining in the mouth after the pulp is destroyed,—dead teeth as they are called? They have given him a great deal of trouble. Within the last two years he had excavated and cleaned thoroughly, and filled at once, and then made an opening through the gum with a lance to the apex of the root, cutting down the bone with a trepanning instrument.

Dr. Rehwinkel is as anxious as any one to save the pulp; but there are cases where we can serve patients better by destroying it in the most harmless manner. It is not in his opinion wrong, but good practice, to resort to arsenic, and he uses it because he don't want to be two weeks about it, and has yet to see the first case of bad effects clearly traceable to its use.

Dr. Taft. The same treatment will not serve in all cases. Local treatment will be required, and the first step is to clear away the debris, remove all irritating matter, and correct the offensive condition by a disinfectant. It is difficult to give a formula for all cases; carbolic acid, chloroform, permanganate of potassa, etc., may be employed. It

is not always good to deplete—sometimes it is well, but sometimes bad. Then use stimulants, tonics, astringents; the object being to relieve the part, and bring it to a state of health. Pulps may sometimes be saved where there is suppuration. Uses simply oxide of zinc with creasote, and over that oxychloride; afterwards fills with gold. Within the last two or three months, had used lacto-phosphate of lime, or lactic acid and phosphate of lime, which can be kept without deterioration. Mixes them into a paste and applies to the pulps in the same way as the oxide of zinc and creasote.

Dr. Allport. Though he has not tried this preparation, has tried treating a pulp in his own person with satisfaction. The treatment of the pulp is the same as that of other parts of the body. For chronic periostitis has used, in a large majority of cases, simply aconite of high potency,—the third dilution (homœopathic,) as many pellets as can be put on a three-cent piece. Do not give too much, and stop as soon as the patient begins to get better. Usually two doses will suffice. Has been astonished at his success with it. Formerly had used mercurius. In troublesome cases, alternates with antimony.

Dr. Hunter had accomplished the same result with a few drops of tincture of aconite, applied in water, locally.

The subject was then passed.

The Committee on Appliances made a report, of which the following is a synopsis:

The committee merely mentioned the articles brought to their notice, among which were—

A vulcanizer, with a self-packer, and a gravity safety-valve. A floss-silk holder for the pocket or office use. An instrument for separating teeth, devised by Dr. O. A. Jarvis, a valuable adjunct in operative dentistry; a tongue and cheek protector, used in connection with the corundum disk on the engine; separating files with corrugated handles, rendering them more easily held between the fingers; a triplex dam-punch, simple and convenient. Improved re-

taining screws with split heads, which give them an advantage over the ordinary screw. A set of four scalers, worthy of attention. Some forceps, burs for engine, and excavators, apparently of fine material and excellent temper. A patent process for packing rubber, which was considered simple and effective. The S. S White dental engine, containing valuable improvements as regards the pitman and flexible arm, running smoothly and noiselessly, and allowing a perfect control of the hand-piece in operating; an hydraulic lift attached to the Harris chair, which accomplishes the desired end with very little effort; an air cushion in the back of chair; also a changeable seat and extension back; a vulcanizer so designed that it may be set at any given pressure, and, so set, will not vary from this point; also, Green's electric engine as improved by S. S. White, heartily recommended to those not employing an assistant; some hard rubber disks, to be used in polishing approximal fillings, highly spoken of by those who have used them.

An electric plugger was exhibited in operation: a beautiful instrument, with no apparent deficiency of power.

An improved vulcanizer, containing an arrangement for closing the flasks after being placed in the vulcanizer, and that without producing any strain on the bottom.

The subject of "Etiology" was then again taken up, and Dr. McQuillen made a report. (This report will be published in a subsequent number of the DENTAL COSMOS.)

Dr. Noel called attention to the action of lactic and acetic acids in the production of decay. Saliva, has, as is well known, the power of converting phosphate of lime into grape sugar. Cane sugar is often present in the mouth and this, by appropriating the elements of water, may be converted into grape sugar. This is composed of the elements carbon, hydrogen, and oxygen; and by a heat of 98° may be decomposed into lactic acid, which immediately attacks the dentine. Acetic acid may also be generated. The tribasic phosphate of lime, of which the dentine is

composed, is converted into the bibasic, and can then be washed away.

Adjourned.

Evening Session.

The Association was called to order at the usual time by the president, the special business being the selection of place of next meeting, and election of officers.

Upon the first ballot for next place of meeting, Niagara Falls, the only place nominated by the committee, was selected.

The election of officers was then proceeded with, with the following result:

President.—M. S. Dean, Chicago.

First Vice-President.—G. W. Keely, Oxford, Ohio.

Second Vice-President.—Jas. S. Knapp, New Orleans, Louisiana.

Corresponding Secretary.—G. L. Field, Detroit.

Recording Secretary.—C. Stoddard Smith, Springfield, Illinois.

Treasurer.—W. H. Goddard, Louisville, Ky.

Executive Committee.—(New members) A. H. Brockway, G. C. Daboll, and S. B. Palmer.

Adjourned.

TO BE CONTINUED.

ARTICLE IV.

On the Condition of the Mouth and Teeth During Pregnancy.—Continued.

BY MR. OAKLEY COLES.

In Rigby's "System of Medicine" (1853, p. 63,) under the head of Disorders of Pregnancy, the author says:— "The breath is usually sour, and an acid state of the saliva is indicated by the instantaneous reddening of litmus paper laid upon the tongue." There is yet another mode in which

increased flow of saliva and the production of an acid reaction may be produced, and that is by the gratification of the morbid taste that sometimes occurs in pregnant women for acid drinks and sour and unripe fruits.

Salivation may occur, but it is rather rare, and, when present, is "easily distinguished," says Dr. Montgomery (quoted by Dr. Churchill, "Manual of Midwifery," fourth edition, 1860, p. 129,) "from the ptyalism induced by mercury, by the absence of sponginess and soreness of the gums, and of the peculiar fœtor, and by the presence of pregnancy."

Hoppe-Seyler (quoted by Wedl, "Pathology on the Teeth," 1873, p. 336) states that after prolonged fasting, and particularly after continued talking, the saliva may become acid. Both of these conditions for inducing acidity generally obtain in women during the pregnant state.

Wright ("Physiology and Pathology of the Saliva," 1842, quoted by Wedl, *op. cit.*, pp. 355, 356,) has observed that there are certain acids present in various specific diseases. Thus acetic acid is found in the saliva with aphthæ, indigestion, and after the use of acid wines, whilst hydrochloric acid is found in connection with simple gastric disturbances. The same observer has noticed that in facial neuralgia the saliva is alkaline, whilst in rheumatic pains in the face the saliva is acid. As these various conditions may arise in the course of pregnancy, they are of interest in the consideration of the subject before us. Beyond the changes that take place in the saliva we must notice the alteration in the connection of the mucus of the mouth. This, like the saliva, is secreted in greater quantities in most mouths during the earlier months of pregnancy; and although, in itself, comparatively innocuous, yet from its peculiar physical character and chemical composition (being rich in albuminoid principles) it tends largely to promote an acid fermentation, by combining with the particles of food lodged between the teeth. (Tomes "Dental Surgery," 2nd edition, 1873, pp. 555, 557.)

By fermentation we may have lactic acid formed in the mouth. (Tomes, *op. cit.*, p. 724.

We thus see under certain conditions the saliva itself may become acid in its re action; that the buccal mucus, by acting upon the decomposing animal tissues lodged around the teeth, may set up an acid fermentation; and lastly, that the mouth is likely to be invaded by acid agents in pyrosis and morning sickness. I can hardly imagine that the alkalinity of the salivary or mucous secretion that can have any injurious effect upon the teeth, although Dr. Garretson ("A System of Oral Surgery," 1873, p. 255) states that in a condition which he describes as oral typh fever, "the patient may be said to labor under the dyscrasia of super-alkaline poisoning, the agent having its point of exhibition most markedly in the mouth."

Whilst Professor Gorgas (Harris's "Principles and practice of Dentistry," 10th edition, 1871, p. 280,) considers that caries "results more frequently from the acid contained in the mucous fluids of the mouth, than * * * from such acids as may be generated by the acetous fermentation of particles of food lodged between the teeth;" but it is certain that from the acidity, however it may arise, we sometimes find the tartar dissolved from the surface of the teeth.

After carefully examining the evidence afforded by published works, and the results of my own observations, with special regard to the action of saliva and mucus during the pregnant state, I cannot but conclude that the great prevalence of caries in women at that period is due in a very large measure to the acid conditions that obtain in the mouth.

It is very remarkable, if simply a coincidence, that the brown variety of caries, which I have found most prevalent in the lower classes, should correspond in its appearance with caries produced artificially out of the mouth by means of lactic and butyric acid.

On the influence of lactic acid, Wedl (*op. cit.*, pp. 418, 419,) mentions that organic chemistry teaches us that it

occurs frequently in partially decomposed animal fluids, and Schmidt has demonstrated the presence of this acid in the fluid obtained from long bones affected with osteomalacia; the analogue of which condition I have endeavored to show as occurring in some of the teeth during pregnancy. Fischer has also obtained butyric, valerianic, and formic acids from strongly alkaline or acid pus, and Wedl suggests "whether these may not occur as products of the decomposition of the puriform secretions of the gums."

Although in the majority of cases we find increased flow of saliva and mucus, in other instances the amount seems normal; and in these cases it is that we get the white caries and softening, with fatty degeneration, the gums being anæmic and receding, but still attached to the higher part of the necks of the teeth. Decay is not so rapid under these conditions, and seems to indicate impaired nutrition rather than altered secretions as a cause, strengthening negatively the views put forward as to the influence of increased and acidulated fluids in the mouth.

But even here we must not overlook the effects of localized acidity such as occurs around the margins of the gums, as pointed out by Tomes (*op. cit.*, p. 555,) and we must bear in mind that the symptoms which I have described, such as softening and disintegration, with white caries, may arise from this cause, either alone or in combination with impaired nutrition; for it would, I think, be exceedingly unsafe to declare absolutely the specific cause for a certain condition of the teeth during pregnancy, when there are so many factors operating, the proper value of which it is almost impossible to take into account.

In an earlier part of my paper I referred to the decay that is sometimes seen on the palatine cusps of the bicuspid and molar teeth, and mentioned that this class of caries was interesting from the peculiarity of its situation. There are I think, two explanations that may be offered for this fact (beyond, of course, the consideration of special structural

defect;) one is that the inner cusps of the bicuspids and molars are those against which fluid would be most forcibly ejected in vomiting, and partially so in pyrosis; and further that the tongue, when at rest, very often lies in contact with these teeth, and so the secretion of acid mucus from the side of the tongue would in time operate injuriously by dissolving rhe enamel.

Before leaving the subject of saliva, it may be well to state that we must not attach an undue importance to its acid condition as a cause of caries during pregnancy, since in healthy males there is occasionally an acid reaction in the intervals of digestion, and in certain acute diseases the saliva is very commonly acid; in fact, it is almost the rule to find the saliva giving an acid reaction under such circumstances.

4. *The Neuralgia of Pregnancy.*—When pain arises in the face or in the regions of one or more teeth during pregnancy, without the presence of caries, we may reasonably ascribe it to a neuralgic origin. Whilst, further, neuralgia thus occurring may have no relation to the teeth, but be entirely dependent on either impaired or perverted nutrition. (Anstie.)

It is therefore not singular that we should find it associated with an anæmic condition of the system and a wasting, rather than carious, condition of the teeth.

This view is clearly set forth in Aitkin's "System of Medicine" (1868, vol. ii. pp. 508-510,) where the author states that facial neuralgia occurs, in the great majority of cases, in patients of an anæmic condition, occurring more frequently before thirty than afterwards, and especially in those whose menstruation is irregular either as to time or quantity.

Ramsbotham ("Obstetric Medicine and Surgery," 4th edition, 1865, p. 646,) writing of the annoyances connected with the pregnant state, says, "Toothache and facial neuralgia are the most common; violent pain is referred to one tooth, or perhaps to the whole of one side of the jaw, with-

out the presence of caries." And again, Murphy ("Manual of Midwifery," and edition, 1862, pp. 55, 92,) writing on toothache, says, "Pain in the ear and face sometimes causes distress, but the most frequent source of misery is toothache. Some caution is necessary when such a symptom presents itself, especially if there be a decayed tooth. The patient may fly for relief to the usual remedy—extraction. This, however, does not afford the customary benefit. The pain may be removed for a short time, but it soon attacks another tooth, and thus renders extraction useless.

In Tome's "Dental Surgery," p. 367, it is stated that "the conditions which seem more often to predispose to neuralgia are the exhaustion of over-work; women are also subject to neuralgia, as opposed to toothache, in the early months of pregnancy."

It would enlarge too much the present paper to give all the extracts bearing upon the subject of neuralgia during pregnancy, that are to be found in the various works on midwifery and nervous diseases. The condition is one that has been fully recognized, and needs, I think, no further evidence in support of the fact of its occurrence.

In most cases the neuralgia is more severe in the first pregnancy than in the subsequent ones; and this remark applies also to toothache, for, although the caries may advance with successive pregnancies, the pain is much more severe in the early pregnancies than afterwards.

5. There are other changes that take place in pregnancy that demand some attention.

"The blood has a rather lower specific gravity than the average, from the deficiency of blood corpuscles. The quantity of white corpuscles and of fibrine, on the other hand, is increased. (Kirke's "Physiology," 5th edition, p. 94.)

And further there is an almost unexplained liability in pregnant and puerperal women to plugging of the veins (thrombosis.) It is not impossible that this fact may in some measure account for the impaired nutrition, from which the teeth certainly in some suffer.

The dropping out of the teeth is, there can be very little doubt, due to an arrested nutrition, and I think has its analogue in the transverse markings of the nails, met with after severe and exhausting diseases

Wedl, in the "Atlas of Dental Pathology" (plate 5. fig. 50,) shows a case of thrombosiis occurring in the pulp of a tooth, and mentions that "it sometimes is seen in the pulps of old permanent and temporary teeth that are in a state of resorption." Impaired nutrition, manifested locally, may however, be due to a perversion of the nutritive elements, or rather the direction of nutrition into a new channel, in order to supply the wants of the growing fœtus. Whether there is resorption of the earthy salts of the tooth, to supply the fœtus with earthy salts, is a question that is open to doubt, but there certainly seems reason for believing that the deposition of the calcareous matter may not take place, and thus produce a condition equivalent to that in which resorption is supposed to occur.

6. *The Remedial Agents useful during Pregnancy.*—In all affections of the mouth and teeth that may come under the notice of the dental surgeon, it is well to see that the general health is being kept up to the highest state of excellence consistent with the pregnant state.

The diet should be simple, nourishing and non-stimulating,—as nearly approaching that of the ordinary regime as possible. But above all things, I believe the use of oatmeal in any form as an article of diet to be of the greatest value to both the mother and child. It may be taken either as oat-cake or in the form of porridge with milk or cream.

The taste for unusual dishes should be controlled, and the longing for sour fruit and acid drinks checked, though the derangement of the digestion, of which the craving is but a symptom, must be fully recognized, and proper steps be taken to rectify it. Where there is increased acid secretion, either from the mouth or stomach, acids should be administered internally, every precaution being taken that their

influence is limited to the stomach, and avoiding as far as possible their action on the oral and buccal cavities. For this purpose, it is extremely important that the acids employed be administered—within half an hour of taking a meal—by means of a tube, the mouth being immediately rinsed out, either with water or with an alkaline gargle. By this means we secure all the advantages of the acid without any of its local ill effects. Either nitric or hydrochloric acid, or the two combined, may be employed for this purpose. Ten drops of dilute nitric acid with bitter infusion, such as chiretta or calumba, with half a drachm or a drachm of tincture of orange peel, is a convenient method of administering the acid.

The carious cavities in the teeth should be filled up when it is possible, in order to allay local irritation and pain; and for this purpose I always found Hill's stopping or Jacob's gutta-percha the best agents. They are bad conductors and non-irritating,—both qualities of great value in a stopping that is applied at such a time.

When the teeth are the subjects of soft caries, or softening or fatty degeneration of the entire tooth, accompanied with great sensitiveness, I have found collodion of the greatest value. The tooth must first be wiped over with cotton wool saturated with alcohol, to remove the greasy surface and absorb any moisture. The collodion may then be painted over the whole of the tooth that appears through the gum, and affords a most efficient yet simple protection against thermal change and irritating substances or liquids. This may be done thrice daily, but as a rule, twice a day will be found to be sufficiently frequent.

Dr. Kock, of Chicago ("Missouri Dental Journal," April, 1873,) recommends covering the teeth and gums with prepared chalk, for allaying the sensitiveness of the teeth, where there is no caries.

When the teeth appear to be breaking down from the severe strain which the pregnancy puts upon all the resources of the patient, cod-liver oil in small and gradually

increasing doses will be found beneficial. As a tooth-powder, precipitated chalk I have found the best, since it not only neutralizes the acidity, but tends to check the flow of saliva if it be an excess.

I have also found charcoal used at night, with plenty of water and a soft badger-hair tooth brush, most serviceable as an antiseptic agent for the teeth and gums, and may also be used as a wash for the mouth before going to bed; thus checking decomposition and acid fermentation from the particles of food that have accumulated between the teeth.

Too much importance cannot be attached to the careful use of the tooth brush before retiring to rest, as it is when the mouth is at rest that a good deal of mischief is done to the teeth. Quinine and chalk as a dentifrice (ʒ j. to ℥ ij.) are also good in some cases in allaying pain of a neuralgic character, and may be ordered with great advantage.

In periostitis, the usual remedies, such as iodine tincture and carbolic acid seem the most valuable; whilst both of these agents diluted may be used as a stimulating application to the gums where there are apparently impaired nutritive processes.

The carbolic acid is also very good where there is a deficient secretion of saliva, such as sometimes occurs; the most convenient form is the following:—

℞. Acid. carbolic.	gr. xij.
Glycerine.	ʒ ss.
Aquæ Rosæ	℥ j.

In those cases in which a purulent discharge arises from around necks of the teeth, the chloride of zinc (gr. iij. to ℥ j.) is useful; it must be applied well with a brush, so as to thoroughly enter between the tooth and gum.

Chlorate of potash and bromide of potassium may also be used sometimes with advantage in certain conditions of the gums and mucous membrane; chlorate of potash being valuable on account of its healing and antiseptic properties and bromide of potassium or its reputed sedative and anæsthetic action.

The treatment of neuralgia must vary according to the cause of the disease and the condition of the patient; as a rule, local stimulation is beneficial, by means of either a mustard plaster or chloroform applied with liniment (℥j. to ℥vij.); sal volatile, hot tea, large doses of quinine, small doses of alcohol, and light and nourishing food, so as to restore the impaired condition of the nervous system. (Aitkin.)

The remedy that I have however, found the most useful is the syrup of the phosphate of iron (Parrish's Chemical Food,)—a teaspoonful twice daily, ten minutes after each meals. This, in my own experience, I have seen give greater relief than many of the agents I have mentioned. Under all circumstances, the treatment must be as gentle as is consistent with efficiency, and all shock saved the already overwrought nervous system of the patient.

Tooth-extraction for odontaigia or neuralgia must never be undertaken without a full recognition of the risk incurred by the mother and child, and the responsibility attaching to the operator; and when absolutely necessary, is, probably, less injurious if performed under the influence of an anæsthetic, such as nitrous oxide or ether or the two combined.—*Transactions of Odontological Society of Great Britain.*

ARTICLE V.

Salivary Calculus.

BY S. JAMES A. SALTER, ESQ, M. B., F. R. S., &C.

I have been making some investigations relative to salivary calculus, and in these I have been assisted by my friend and colleague, Dr. Stevenson, who analysed several specimens for me.

I have thought it might be desirable to place the results on record.

Salivary calculus exists in two distinct conditions—as *Tartar* on the teeth, and *Stones* within the ducts of the salivary glands.

Tartar differs a good deal in different specimens as to its physical and somewhat as to chemical characters. It is deposited from the compound fluids of the mouth, and it has, entangled in it, a certain amount of extraneous matter, such as shed epithelium and a notable quantity of the fibres of the mouth-fungus, *Leptothrix buccalis.*

The calcareous *Stones* that are found in the salivary ducts are necessarily the produce alone of the secretion of the glands in whose ducts they are formed.

Between tartar, in its several varieties, and the duct-stones there appears to be one constant chemical difference, namely that the latter contain a much larger amount of *carbonate* of lime.

Dr. Stevenson's analysis of tartar have been made with mixed specimens, soft tartar taken from molar teeth, and hard masses removed from the lower incisors.

MIXED SPECIMENS.

Phosphoric acid	29.72
Lime	35.70
Magnesia	6.22
Organic matter	20.27
Water	7.33
Carbonic acid, a trace.	
	90.24

SOFT TARTAR FROM MOLARS.

Phosphate of lime with a little carbonate and a trace of fluoride	77.21
Phosphate of magnesia	1.31
Organic matter	16.33
Water	5.15
	100.00

HARD TARTAR FROM LOWER INCISORS.

Phosphate of lime, with a little carbonate and some fluoride	81.18
Phosphate of magnesia	1.31
Organic matter and water	17.51
	100.00

I believe a considerable portion of the organic matter in tartar consists of Leptothrix fibres that have become encrusted and covered in by the calcareous deposit. Indeed I think it highly probable that the meshes of the fungus fibres may contribute to and facilitate the deposition and solidification of the lime salts.

If tartar is dissolved by hydrochloric acids numbers of minute threads are seen remaining when the specimen is examined by high powers of the microscope; and I have found that these so persistently resisted the solvent action of chemical reagents that I was disposed to think they were silicic in their nature. Dr. Stevenson, however, failed to discover a trace of silex in any of the specimens he analyzed.

It is said that the tartar formed on the molar teeth and supposed to be derived by the parotid glands contains more carbonate of lime than that deposited elsewhere. Dr. Stevenson's analyses did not bear out this idea.

The salivary duct-stones, as I have observed, contain much more carbonate of lime than the tartar on the teeth.

Some years ago Dr. Taylor, of Guy's Hospital, analyzed several of these concretions, and the following was the general result of a number of museum specimens, without distinctions as to the glands that furnished them.

Animal matter	25
Phosphate of lime	55
Carbonate of lime	15
Carbonate of magnesia	1
Oxide of iron	2
Loss	2
	100

The fact that the calculi were probably derived from different glands might be presumed to rob the analysis of much of its interest, as the secretion of the different salivary glands is not the same. Dr. Taylor, however, analyzed one large duct calculus, which certainly came from the submaxillary gland, and with nearly the same results, as shown below:

Animal matter, salivary mucus containing nitrogen and sulphur	32.00
Phosphate of lime, with traces of phosphate of magnesia	55.40
Carbonate of lime	13.60
	100.00

The history of the latter calculus is interesting, and I cannot do better than conclude this brief communication by narrating it and an account of the patient from whom it was obtained.

Mrs H—, æt. 59, of healthy constitution, was seized on the 14th of February, 1874, with very severe pain at the base of the tongue and on the left side of the jaw in the situation of the submaxillary gland; great swelling took place in these parts during the day, and the gland was very hard, continuing to get rapidily worse for three days.

At this time Mr. F—(a general practitioner) was consulted. By making one or two small openings by the side of the frænum linguæ he suceeded in extracting three small calculi about the size of a goose shot. The pain abated for a short time after their extraction, but became worse towards evening. On the following night, leeches were applied to the side of the chin, as the size of the tongue and floor of the mouth, especially at the back part, almost obstructed the pharynx, and the breathing became very laborious. About an hour after the applications of the leeches an abscess broke near the entrance of the submaxillary duct, which gave great relief both as to pain and breathing. Although the swelling from this time gradually subsided, severe pain continued at intervals, the abscess appeared alternately to gather and break, the pain being alleviated after each discharge, whilst the submaxillary gland remained very hard.

Matters continued in this state for above three months. With a bent probe a hard substance could be distinctly felt about one-third of an inch from the opening, and with a small pair of bent forceps little pieces could be broken off, but it was found impossible to remove a large piece. As

the patient was not permanently relieved by the extraction of such small fragments, and it being probable that a large calculus was situated deeply in the duct, an incision was made about an inch and a half long by the side of the tongue so as to extend some distance before and behind the opening; a pair of dressing forceps was then inserted, and after a little trouble the calculus was removed; no particular hemorrhage occurred, but the pain was very great. A piece of lint was left in the wound, which healed completely in about a month without a bad symptom. The tongue gradually recovered its proper position; the submaxillary gland also, which had been previously almost of scirrhus hardness, slowly became soft and natural. The recovery was complete.

The calculus was nearly globular and the size of a small marble. It weighed fourteen grains.—*British Journal of Dental Science.*

ARTICLE VI.

On the Physiological Action of Arsenious Acid.

Professor Boehm, of Dorpat, records in the *Archiv fur Experimentelle Pathologie und Pharmakologie*, vol. ii. Heft 2, his own researches and those of his pupils, on the physiological action of arsenious acid. The experiments were conducted by S. Unterberger upon cats and dogs. On injections of a watery solution of arsenious acid into a vein, a gradual sinking of the mean blood-pressure occurs. The amount of sinking is in direct relation to the quantity of arsenic employed. This sinking is never preceded by an increase of the blood-pressure, and is only temporary when it owes its origin to small doses (0.005 to 0.03 gramme.) At the same time, the pulse is rendered slow. These phenomena can be ascribed partly to paralysis of the abdominal blood-vessels, and partly to a diminution of the capacity of the cardiac muscles for action. The cardiac nerves in animals poisoned with arsenic exhibit normal relations. The

vessels of the sympathetic areas are not paralyzed by the poison.

The action of this drug upon the intestinal canal was also studied. To arsenious acid is generally ascribed a local irritating action. The chemical reason for this irritating action is quite unknown. This substance exhibits no special affinity either for water or for albuminous bodies. The action of this drug was studied in similar animals (dogs of the same size, age, weight, etc.) and its effect contrasted according as it was introduced by the mouth or by injection in solution into the circulation. When one has before him two similar animals which have been poisoned with arsenic it is impossible from the *post-mortem* appearance to say which of the two animals has received the poison by the stomach or through the blood. Not only so, but the phenomena during life are similar, and the only difference is that the smallest lethal doses when given by the mouth, are not sufficient to kill a similar animal when injected into a vein; and that in the latter mode of poisoning, death always occurs somewhat later than in poisoning through the stomach.

After death, no matter how the poison was introduced, the mucous membrane of the stomach throughout its whole extent was tinged dark red, was considerably swollen, and presented a velvety appearance. The redness was always confined to the most superficial layers of the mucous membrane. In the serous membrane of the stomach, beyond a very pronounced filling of the vessels, numerous large ecchymoses were generally present; loss of the substance of the mucous membrane was never observed. The degeneration of the gastric glands, described by other authors in the rabbit, were not found. Essentially different was the appearance throughout the whole length of the intestinal canal. The mucous membrane was covered throughout its entire extent by a yellow-coloured, jelly-like, but still consistent membrane about one millimetre thick. Microscopically, this membrane appeared to consist of innumerable pus-cells,

embedded in a structureless material. This membrane could be removed, when the mucous coat was exposed, generally filled with small point-like ecchymoses. The villi were greatly swollen,, and were devoid of epithelium over their entire surface, and numerous pus-like cells were also embedded in their substance. In the other organs, nothing remarkable was found. The liver and kidneys had never undergone fatty degeneration. Ecchymoses in the endocardium of the left ventricle were constant, often also in the other serous membranes. These results are not favourable to the assumption of a local irritating action of the poison. The authors hold as unexplained the action of arsenic on the gastro-intestinal tract. Schmiedberg remarks the resemblance of the action of sepsin to that of arsenic, in that the former exhibits on local action. In the intestine, only traces of arsenic were found on analysis of its contents by the Marsh method.—*London Med. Record.*

EDITORIAL. ETC.

The Southern Dental Association.—The next Annual Meeting of this Association will be held in Memphis, Tennesee, on the 9th day of February, 1875, "Marde Gras Day," commencing at 10 o'clock A. M. The Recording Secretary informs us that the Rail Roads will grant half fare tickets to those visiting Memphis on the occasion of "Marde Gras."

It is sincerely hoped and expected, that the members of the following Committees will correspond with each other, so as to act in concert, and furnish a report upon the subjects on which they are appointed, and thereby make our next meeting one full of interest and instruction.

Officers.—Dr. J. R. Walker, Louisiana, President; Dr. Isaiah Forbes, Mo., 1st Vice President; Dr. W. G. Redman, Ky., 2nd Vice President; Dr. R. R. Freeman, Tenn., 3rd Vice President; Dr. Homer Judd, Mo., Corresponding Secretary; Dr. Jas. F. Thompson, Va., Recording Secretary; Dr. J. Hall Moore, Va., Treasurer.

Executive Committee—Drs. W. T. Arrington, Memphis, Tenn.; W. H. Morgan, Nashville, Tenn.; Jas. S. Knapp, New Orleans, La.; H. J. McKellops, St. Louis, Mo.; S. H. Henkel, Staunton, Va.

Membership—Drs. S. J. Cobb, Nashville, Tenn.; C. A. Jordan Huntsville, Ala.; W. G. Redman, Louisville, Ky.

Publications—Drs. R. B. Winder, Baltimore, Md.; J. F. Thompson, Fredericksburg, Va.; Homer Judd, St. Louis, Mo.

Dental Education—Drs. Homer Judd, St. Louis, Mo.; H. J. McKellops. St. Louis, Mo.; B. F. Coy, Baltimore, Md.

Dental Literature—Drs. W. H. Eames, St. Louis, Mo.; J. P. H. Brown, Augusta, Ga.; F. J. S. Gorgas, Baltimore, Md.

Physiology and Surgery—Drs. W. H. H. Thackston, Farmville, Va.; J. S. King, Nashville, Tenn.; A. F. McLain, New Orleans, La.

Histology and Microscopy—Drs. W. H. Atkinson, New York, City; S. P. Cutler, Memphis, Tenn.; J. H. McQuillen, Philadelphia, Penn.

Dental Chemistry—Drs. J. Taft, Cincinnati, Ohio; R. Finley Hunt, Washington, D. C.; Robt. Arthur, Baltimore, Md.

Pathology—Drs. Isaiah Forbes, St. Louis, Mo.; Arthur Ford, Atlanta, Ga.; E. Floyd, Fayetteville, N. C.

Dental Therapeutics—Drs. W. H. Morgan, Nashville, Tenn.; F. Y. Clark, Savannah, Ga.; R. B. Winder, Baltimore, Md.

Operative Dentistry—Drs. H. J. McKellops, St. Louis, Mo.; J. G. Wayt, Richmond, Va.; J. S. Knapp, New Orleans, La.

Mechanical Dentistry—Drs. Jas. Johnstone, Staunton, Va.; S. Augspath, Helena, Ark.; J. G. McAuley, Selma, Ala.

Voluntary Essays—Drs. W. H. Morrison, St, Louis, Mo.; J. B. Patrick, Charleston, S. C.; H. B. Noble, Washington, D. C.

Dental Appliances and Improvements—Drs. Stellwagon, Philadelphia, Penn.; Wm. Deasen, Mobile, Ala.; W. G. Kingsburg, San Antonio, Texas.

A Warning to Dentists.—A man giving his name as Anson A. Clark called upon Dr. Samuel Bridges, a dentist, Brooklyn, N. Y , Wednesday, and said that his wife wanted a set of teeth. He wished to surprise his wife, and would therefore pay the doctor in advance, directing him to give his wife a receipt in full when she called. Clark showed Dr. Bridges two checks, one for $100 and the other for $125, asking him if he would give the change. The doctor gave a check for $75, and the latter bade him good afternoon. A short time afterward the dentist became suspicious and went to the bank. He found that his check had been cashed, and that those of Clark were worthless.

Preparing Vegetable Tissues for the Microscope—A New Discovery.—Dr. W. G. Harrison, of the Maryland Academy of Sciences, reports that the committee of biology and microscopy, while pursuing the subject of improvement in preparing and mounting subjects for the microscope, discovered a new mode of preparing fresh vegetable tissues—a discovery of much importance. This process may be briefly described as follows: First, the specimen, say a leaf, is decolorized by soaking in a solution of chlorinate of soda. Second, the soda remaining in the leaf is removed by washing in water. Third, the leaf is then washed, first in dilute alcohol, increasing its strength gradually until the water is removed. Fourth, the specimen is then submitted to one of the staining fluids known to the art; analine blue is generally used, and was selected for the slide shown by the doctor. If too much color is given, it can be partially removed by alcohol. Fifth, a solution of oil of cloves is then used to remove the alcohol. Sixth, the leaf being properly prepared, is mounted with Canada balsam.

MONTHLY SUMMARY.

On Intra-buccal Resection of the Inferior Dental Nerve after Paravicini's Method; Recovery.—Dr. Mosetig-Moorhof, of Vienna, says (*Wiener Medizinische Wochenscrift*, March 21, 1874) that the various methods for the division of the inferior dental nerve, which have been proposed in cases of severe neuralgia, are as follows. The vast superiority of the process invented by Paravicini will be at once perceived.

1. Division of the cheek through its entire thickness, at a spot corresponding with the anterior edge of the ramus of the jaw, without dividing the mucous membrane.

2. Division of the cheek at a spot corresponding with the sigmoid notch, in a direction upwards.

3 Division of the soft parts over the posterior border of the ramus of the jaw, in a direction from behind and below, inwards and upwards.

4. Removal of a portion of the angle of the jaw.

5. Trephining the ramus above the commencement of the canal after division of the soft parts.

The method adopted in the case reported by Dr. Mosetig-Moorhof was as follows: The mouth being widely opened, the mucous membrane is divided along the anterior border of the ramus of the jaw, and the finger is directed between the bone and the internal pterygoid muscle to the lingula. The separation of the inferior maxillary from the gustatory nerve is not difficult, since the former passes into the canal and the latter does not. The operation, however, is so far difficult, since the eye cannot be of any assistance, and the operator must trust to his power of touch, and has to work in a very constricted and narrow space; but the result is great relief to the patient, and no disfigurement at all as there is after the before-mentioned methods.

Dr. Mosetig-Moorhof operated on his patient on July 31, and having found the lingula, divided the internal lateral ligament of the jaw. The nerve and artery were secured by a thread, which was passed round them by means of a small aneuism-needle (it being absolutely necessary to fix them in order to cut through the nerve centrally) and so removed a piece of it. A piece of nerve about four inches long was removed. The re-

action which followed a cessation of the neuralgia, and a want of feeling of the right side of the lower jaw, was trifling. Beyond a swelling of the side of the face and pharynx, with some slight difficulty of swallowing, the patient had little to complain of.

The patient was perfectly well by the end of January, and had lost all symptoms of neuralgia.—*London Med. Record.*

Treatment of Dog Bites—If measures are not adopted to stamp out rabies in the dog, then we must endeavor to find a means of treating the bite in such a way as to render it, if possible, harmless. When we consider this subject, difficulties assail us which seem well nigh insurmountable, and make us doubtful of ever attaining the desired end. When we reflect on the rapidity with which substances are absorbed, and travel the whole round of the circulation, we are inclined to question the efficacy of any treatment after the bite is made. It is, however, possible that the peculiar poison of rabies may have a slow rate of absorption, and so give us some chance of removing it from the wound, or rendering it by some means innocuous. Hippocrates of old, in his wisdom, which we all admire, said that the physician must "have two special objects in view with regard to diseases, namely, to do good or to do no harm." That is a maxim the ventilation of which might be of eminent service, even in this enlightened age, in general practice, and it is particularly appropriate when we come to consider what must be done with the bite of a mad dog.

Tetanus is a disease which, in its symptoms, has a peculiar resemblance to hydrophobia. Spasms occur in each on the slightest irritation of any of the organs of sense; both are peculiarly diseases of the nervous system; and in neither, on post-mortem examination, is there anything very definite to account for death. Tetanus we know to be caused by a wound, more especially by a wound which does not heal quickly. Hydrophobia is not supposed to be caused by the wound, but by the saliva, in which some virus exists. Nevertheless, it would seem right that we should not follow any treatment which can retard the healing process.

The principal indications, then, for the treatment of a bite are:—

1. As soon as possible to remove the virus from the wound or render it innocuous.

2. To get the part healed as speedily as possible.

With regard to the first indication, so soon as the bite is inflicted it is not likely that a surgeon can be at hand, and so it would be well for the patient to suck the parts vigorously, if they are within reach. That will encourage bleeding, and tend

to remove any saliva that may be in the parts. A ligature between the wound and the heart might also be applied to encourage bleeding. When the surgeon is consulted I would advise, when the dog is known to be rabid, excision of the bitten parts where practicable; afterwards, aud where excision cannot be performed, I would wash out or syringe the parts freely with a saturated solution of carbolic acid in very hot water, and get the wound healed as soon as possible.

By that means I think we may hope to remove by excision or destroy by the carbolic acid any virus in the wound, at the same time expedite the healing process. By such a method of treatment we can do no harm, and from the well known properties of carbolic acid, we may hope that it will do some good—*London Med. Times & Gazette.*

Treatment of Malignant Pustule.—The Paris correspondent of the *Irish Hospital Gazette* states that at a meeting, lately, of the Academy of Sciences, M. Bouley presented a memoir by M. Cezard, on what he terms the anti-virulent method of treating charbon, or malignant pustule, basing his theory on the experiments performed some short time ago by M. Davaine, illustrating the anti virulent properties of certain chemical agents. According to the author of this paper, iodine is considered the best antidote against the poison or virus of charbon, or malignant pustule He states that a dose of one-twelfth of a milligramme of iodine is sufficient to destroy the virulence of the fluid of malignant pustule, that is to say, when mixed in a test tube; but that it will take much less to prevent or even destroy the virulence of this terrible affection when the drug is introduced into the organism. M. Cézard informs us that an animal can support, without any inconvenience, the introduction in the blood, at one and the same time, of a quantity of iodine amounting in weight to more than one-five-thousandth part of the entire mass of blood, that is to say, more than is sufficient to destroy instantaneously the virulence of malignant pustule, when the latter exists, and to prevent its development, when once the virus is introduced into the organism. Iodine whether administered by the digestive tube or by hypodermic injections, is absorbed in substance, and preserves its special properties even in the blood. M. Cézard advises that the drug be administered in the form of iodide of iodine, that is, in the proportion of one part of iodine to two of the iodide of potassium, which renders it more soluble in water and mitigates its irritating properties. This method of treatment, he continued, is very efficacious, not only against the true malignant pustule when it has attained the stage characterized by œdema, but also before it reaches that period, and even against the symptomatic fever

of malignant pustule. M. Cézard also employs iodine locally in this affection, in the form of subcutaneous injection of a solution in the proportion of one-five-hundredth, and in the form of lotions, in the proportion of one-hundredth of the iodide of iodine. If there be a slough this should be previously excised, in order to facilitate the action of the drug.—*Ibid* —*Nashville Journal of Medicine and Surgery.*

To Keep Away Flies.—The sick and wounded are, in warm weather, often dreadfully annoyed by fles, The suggestion of a French veterinary surgeon deserves trial at such times. He says that a simple method of preventing flies from annoying horses consists in painting the inside of the ears, or any other part especially troubled, with a few drops of empyræumatic oil of juniper. It is said that the odor of this substance is unendurable to flies, and that they will keep at a distance from the parts so annointed. If this treatment should accomplish the alleged result, it will be a great blessing to introduce into the sick room.—*The Cincinnati Lancet and Observer.*

Influence of Anæsthetics upon the Sexual Impressions of Females.—A writer ("London Medical Clinic") says it is a well established fact, that occasionally, under the influence of ether or chloroform, an excitation of the sexual organs is produced, and a feeling is excited in the mind by this sensation which may make a woman believe that she has been subjected to violence. In illustration of this statement the writer says, that during delivery, he placed the woman under chloroform. The sexual sensations of the woman were so vivid that she accused him of having violated her. Yet her husband and a dozen women had been present the entire time of delivery. Other illustrations are given, from which the wise moral is deduced, "that physicians should never administer ether or chloroform except in presence of witnesses."—*American Medical Weekly.*

Electricity a Substitute for Gas or Coal-Oil.—The danger of kerosene may possibly be done away with by the invention of a Russian who claims to have discovered a process for producing light by electricity, which is thus described: A small tube of glass, not more than six inches in length, is filled with a pencil of charcoal; the air is exhausted and the tube hermetically sealed. A moderate current of electricity is then passed through the charcoal from an ordinary electro-magnetic machine, causing it to glow with a very brilliant, but at the same time a soft light. It is stated that the charcoal is not perceptibly consumed by the process, but will last for an indefinite period, and

that the strength of the current reqnired is so small that two hundred of these lights, at a considerable distance apart, can be easily maintained by a single machine. The inventor claims that he can light the whole city of St. Petersburg, both street-lamps, stores, and private residences, by a single fifteen-horse-power machine, with no greater cost than that of running the machine. Moreover, all the lamps in the city would be lighted at the same moment, and private lights would need no attention, except the shutting off of the current from the house when desired.—*Tenn. Phar. Gazette.*

Ante-natal Development of Nine Teeth.—At a recent meeting of the Philadelphia Obstetrical Society, Dr. C. H. Thomas related the case of an infant which, though normally constitnted otherwise, exhibited nine perfect teeth when born. In addition to these, a number of small, whitish nodules could be seen and felt along the line of the gums, above and below, lying underneath the mucous membrane, and evidently marking the location of all the other deciduons teeth.—*Amer. Jour. of Obstetrics.*

Celluloid.—It is said that several companies have been formed in this city for the manufacture of different objects from celluloid, the new substitute for ivory. As originally prepared it consisted of a combination of soluble cotton and ether or alcohol, but it was subsequently ascertained that a still more satisfactory result could be obtained by the addition of camphor to the alcohol; and finally comphor alone was mixed with the ground cotton pulp, which hardens in drying and becomes "celluloid." Probably this substance will also find various uses in surgery.—*Phil. Med. and Surg.*

Handy Method of Examining Nervous Tissues Microscopically.—D. Tuke gives the following convenient method for examining nervous tissues. It is not intended to take the place of the old processes, but to supplement them:

A portion of nerve tissue, the size of a large pin's head, is taken from a thoroughly defined locality. It is gently flattened under a covering glass on a side. The covering glass is then removed, and a drop of "Judson's simple (aniline) magenta dye," diluted with eight drops of water, is applied to the mass. With a needle this dye is carefully mixed with the nerve matter. The preparation is covered with a clean glass, and gently pressed until light can pass through it. Specimens so prepared will clearly exhibit the nerve cells, nuclei of the neurologia, and the blood-vessels, tinted a deep crimson color, leaving the other tissues unaffected.—*British Med. Journal.*

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ARTICLE I.

Thoroughness and Honesty in Dental Operations.

BY DR. H. H. TOWNSEND.

Read before the Illinois State Dental Society.

It is not my purpose in writing upon this subject to detail any special mode of practice as superior to all others, or applicable in all cases, much less to assume the position of teacher, and attempt to instruct such a body of skillful operators as compose this society, but rather to allude in a general way to some of the more important and frequent deviations from the commonly approved rules of practice. That the *importance* of "thoroughness and honesty in dental operations" is very generally admitted by the dental profession, I believe is true, but that its *observances* is as *generally regarded* in the daily practice of very many operators is, to say the least, doubtful. A law with which every one is familiar, yet, is never enforced, simply exists as a "dead letter" on the statute books. So likewise, the fact that every dentist knows and admits that he ought to be *thorough* and *honest*, avails nothing to those who are too

indolent or greedy to practice what they believe to be for the best good of their patients. That there are many in the dental profession who need reforming in this respect, the number of defective operations that almost daily come under our observation will testify, as well as the multitude of useful teeth that are yearly sacrificed to make room for *very false* substitutes.

That some of these men at least know what their duty is in this respect is evident from the fact that they flood our streets with hand-bills informing the public that they do their work *thoroughly* and *honestly*, and lest the truth of their statements be doubted, get their local editors to impress it upon the minds of their readers from time to time, usually calling attention to the *prosperity* of Dr. so and so, and with wonderful sagacity discover among other reasson that the Doctor *understands his business*, and his operations although short and painless, are still *very thorough and honest.* As to being *posted* in their business, if they mean the *advertising* part of it, we fully agree with them, and that they are quick in their operations must also be admitted when they prepare and fill from six to a dozen cavities with gold in an hour, and of course, no one can doubt that a man is a *thorough* operator when he succeeds in finding fourteen cavities in a mouth, where a very superficial examination reveals twenty-five, and that a man is *honest* in his operations requires no further proof than his own statement, that in difficult cases he charges so much for gold filling, patients are compelled to choose amalgam instead. We can, however, hardly consider a man a *thorough* operator, be he never so honest, who passes an instrument out beyond the cervical wall of a proximal cavity until it penetrates the gum which he mistakes for the pulp, and repeatedly attempts to destroy it with arsenic, and after failing to do so, attempts to extirpate it with a barbed broach, and after barbarously tearing off a sufficient quantity to correspond to his idea of the size of a tooth-pulp, proceeds to fill the root, which he does by forcing all the gold

he can up into and under the gum; and we cannot wonder that the patient was subsequently opposed to root-filling. We might wonder, perhaps, *why* the people of certain towns *will not pay* for gold filling, and *why* their dentists being ashamed of the quantity of amalgam they use, write letters of apology to the dental depots in consequence; did we not *know* that they tell their patients that the difference between gold and amalgam is, that the latter will preserve teeth a lifetime while gold will last twice as long. Their patients of course, gladly avail themselves of the cheap and easy method of preserving their teeth as long as they live. It would seem however, that a "life time" does not necessarily imply as long as the patient may live, as we usually find that six months, and in some cases as many days even is too long a "life time" for their operations to endure. We know there are those however, who do nothing but thoroughly honest work, and they have achieved very enviable reputations by the excellence of their operations.

They are among the organizers and leaders of this and kindred societies, and not among that class of dentists who require high sounding testimonials to establish their reputation, and the constant and vigorous exertions of their local editors to preserve and protect them, and who really do make one filling of two proximal cavities, erecting a suspension bridge across from one tooth to the other, and treat all difficult cavities, ulcerated teeth, and dental irregularities alike with the forceps. While we recognize the shortcomings of others, let us not like the Pharisee, "thank God we are not as other men," but let us rather become our own critics, and see if at all times, and under all circumstances, we are strictly adhering to our principles of "thoroughness and honesty." Suppose we are operating for a patient from an adjoining town who must return by a certain train, and we are trying to employ every moment to the best possible advantage. The tooth, a second lower molar, is badly decayed; a large cavity in the grinding surface nearly exposes the pulp, while a deep cavity on each

proximal surface extends some distance below the gum. The application of the rubber dam, and forcing back the gum, occupied considerable time aud was quite painful, and our patient has become so nervous that it is with great difficulty that we make any progress in the preparation of the cavity, which is exceedingly sensitive. The time is half consumed and still the cavity is not prepared and it will require about all the remaining time to properly fill it. We make another desperate effort and at the end of half an hour find that but little has been accomplished. What is to be done? We suggest a temporary filling and a subsequent sitting, but the patient cannot come again, therefore what we do must be done now. If we give it up we will lose the whole half day, as we are quite certain he will not be willing to pay us for the time already expended unless we complete the operation; as it is improbable that we can make a perfect operation of it in the limited time now remaining, it becomes a questian whether we shall sacrifice a living tooth, the confidence of our patient, our own honor and integrity for the small fee which we expect to receive for the operation. Suppose however, as we are greatly in need of the money, we decide to reduce the fee in proportion to the quality of the work, and fill it as well as we can under the circumstances, hoping it will at least be worth to him all we charge for the operation. We know there ought to be some kind of a non-conductor used at the bottom of the cavity to protect the pulp from thermal changes, but the time is too limited to attempt it. We therefore place the gold in direct contact with the thin layer of sensitive dentine over the pulp, and proceed to fill as fast as we can, being painfully aware that we are not condensing the gold as thoroughly as it ought to be, especially about the margins, but the filling is as good as the preparation of the cavity, and both correspond to the finish, which consists in passing a separating file down each proximal surface, and slightly burring off the top of the filling, which is being done as we hear the whistle. The patient has just time to pay

us our fee and get to the train. Let us suppose we received eight dollars for the operation. We might very appropriately enter on our day book, sold this day for eight dollars "one living tooth, confidence of one patient in dental operations, our own honor and integrity."

For the next few weeks we feel an occasional twinge of conscience, and find ourselves constantly inclined to slight our work. The case is finally forgotten and we once more resume our accustomed habit of thorough operating. Suppose some two years later we have a patient in our chair who belongs to one of the most wealthy and influential families in our town. We find upon examination a dozen or more cavities, but the teeth are of good quality, and the decay is not extensive, and we have no doubt but that they may be preserved by proper treatment. But she is opposed to filling teeth, having had hers poorly operated upon some years previous, and now desires to have them extracted and some artificial ones inserted. We, of course, decline to extract them, and after an extended argument in favor of conservative dentistry, she has about decided to make some appointments and try our efforts for their preservation. At this moment the door opens and our patient of two years previous presents himself, stating "that as he happened to be in town he thought he would just step in and tell us that the tooth we filled for him about a year ago, (they always reduce the time at least one-half) has caused him a great amount of pain; that the filling came out, and the tooth broke off, and he is very sorry he did not have it pulled out in the first place." Also, "that he has other decayed teeth, but he is going to have them extracted and have false ones." What *fee*, let me ask, would we consider a *sufficient remuneration* for this unhappy result? Surely, nothing short of a fortune that would enable us to retire from dental practice, and live at our ease.

This, and similar experiences should at least teach us that *hasty manipulation* is not productive of the best results, and that a *reduced* fee can never *compensate* for a *faulty*

operation, *poor* work being *dear* at any price. Prof. McQuillen once said that we were justified in charging for the extra time required to do our work thoroughly, but never excusable for negligence of duty. If want of time, or the perverseness of our patients, or any other obstacles interpose to prevent us from doing what our best judgment dictates, we had better decline the operation than to attempt it, and by our failure bring reproach upon ourselves and the profession, which is, of course, judged by the acts of the individual members comprising it. Fortunately such cases are exceptional, but a *reality* nevertheless. It has been my misfortune to meet with two of this kind since our last meeting, both of which I gave up in despair, after exhausting every known means at my command, and patiently and perseveringly spending two half days upon each of them, and really accomplishing nothing. If the very best efforts of the most skillful operators sometimes fail, which is an admitted fact, how can we expect permanent results from our own operations which we *know* are hurriedly and imperfectly performed? And how can we consider ourselves *honest* men if we advise a cheap plastic filling, recommending it to be *just as good as gold*, because the case is a difficult one, or the patient poor, and the next hour when operating on an easy cavity, and for a wealthy patient, advise gold as *the only thing fit to fill teeth with?* Or how shall we justify ourselves as *thorough* operators, by filling cavities in the masticating surfaces of molars and bicuspids, and *guessing* there are no proximal decays. It is our *duty* to deal honestly with our patients, and our *business* to *know* the true condition of the teeth upon which we are operating, and if with the aid of the rubber dam, magnifying mouth mirrors, and quick wedging we are still unable to ascertain the real condition of the proximal surfaces, let us resort to a slower and more effective process of wedging, and if it requires a week's time or more to separate them sufficiently to enable us to obtain the desired information, let us take it, but at all events let us know that the teeth are *sound* before

we dismiss them as such. Let us also bear in mind that if we would be consistent as *thorough* and *honest* dentists, we should never dismiss a patient as having no further need of our services, until the whole mouth is in a heathy condition. Not only as already intimated, should all the imperfections of the teeth be searched out and properly cared for, as the requirements, of the case may indicate, but all deposits of tartar or other accumulations should be removed with the utmost thoroughness, not only from the labial surfaces of the anterior teeth, but from *all* the surfaces of *all* the teeth *below* as well as *above* the guns, which, if diseased, should, if possible, by proper treatment, be restored to health.

While this paper is not designed to discuss the relative merits of the different materials employed for filling teeth, yet it seems almost necessary in treating of this subject to refer to the use of amalgam as one of the principal causes of careless and slovenly work. There may be cases when its use is justifiable, but it should be the *exception* and not the rule. I know it is argued by many that the poorer classes must have their teeth saved with something, and they cannot afford gold. But the question arises, *does* amalgam preserve teeth? I think a large majority of the best operators in the profession agree that it makes a very unreliable filling at best.

If this is *true*, we are not saving the teeth of our poorer patients by its use, and *they*, of all our patients, can least afford to pay for an inferior kind of work which is almost certain to fail. The Scriptures tell us that "the destruction of the poor is their poverty," which would seem to be especially the case when they pay their money for poor dental operations, which, when once or twice repeated cost more than would have been paid for good work in the first place, and result in the loss of both money and teeth at last.

Another objection to the use of amalgam is that it unfits the operator for more thorough operations. If "evil communications corrupt good manners," which the good book also tells us is true, we certainly should not cultivate a very

intimate acquaintance with this "black visaged imp." I venture the proposition that any one who constantly fills teeth with amalgam three days in the week, will meet with very poor success with the use of gold the balance of the time, should he attempt it. If it is *true* that our patients of limited means cannot afford to pay for cheap operations, it is *also true* that we cannot afford to turn them off with work of an inferior quality. For experience has proven that they are quite as likely to make known our success or failures as are the rich, and in this world of change, and particularly in this free land of ours, no one can predict with any degree of certainty, what will be the financial or social condition of our patients a year hence. The servant of to-day may be mistress of the house to-morrow, and the man of wealth who to-day sits in our chair may be a hod-carrier when next he requires our services. It ever becomes us therefore to try and do good alike to rich and poor, making each operation as perfect as we know how to make it, and if possible an improvement upon the preceding one, and though we may never have an abundance of wealth, we will enjoy the confidence and respect of the majority of our patients, and have the consciousness within our own breasts of having faithfully performed our duty.

ARTICLE II.

Atrophy of the Teeth.

BY N. MARSHALL BURKHOLDER, D. D. S., HARRISONBURG, VA.

Read before the Virginia State Dental Association.

In 1872, Mr. C. brought his daughter, aged 21 years, to me to see what could be done for her mouth.

Upon examination, I found the teeth, 29 of which were present, to present the worst case of what was apparently Atrophy I had ever seen, and also the most unsightly ap pearance. I extracted them all, and, by the way, at one sitting, without anæsthetics, simply giving one wine glass of whiskey, and have them now before me mounted in plaster and articulated.

Upon opening the mouth, perhaps the first thing which would be noticed is the uniform dirty brown color of the teeth. The crowns are of medium size and well shaped. The fangs are long, very white and well developed; and the articulation and general arrangement good.

The peculiar feature of the case is that with the exception of several carious points or proximal surfaces, and these not of a serious character, the teeth are nowhere affected with disease or loss of structure save on their cutting edges and grinding surfaces and extending over their sides, uniformly, about one line or more around each tooth. Here a denuding process has been at work diverting the crowns of enamel in its progress, the enamel terminating at its margin with a more or less abrupt shoulder around the body of the teeth, showing its varying thickness; and the dentine, thus pealed as it were of its coat, standing alone.

On some of the teeth shrivelled enamel is left in part on the central portions of the grinding surfaces, and a close examination would seem to show the destructive process has been slower here, its ravages being more extensive, and uniformly so, on the cusps and just outside the margin of the grinding surfaces a uniform distance. On several of the oral teeth it has affected chiefly the anterior surfaces, but in most cases it has extended entirely around the teeth.

Upon inquiry, the parent, who in appearance is a stoutly built, sinewy, laboring man, stated that the teeth possessed their present dirty brown color when erupted. Other members of his family are similarly affected. His grandmother had such teeth. There are traces of it in his own mouth. There is abundant evidence of the scrofulous and rheumatic diatheses in the young lady's ancestors.

We have here plainly the result of an imperfect enamel formative process, aggravated by denudation since eruption, in which, doubtless acidulated oral secretions played a prominent part.

And whatever may be the proximate cause of the defective enamel formation, it would appear beyond all doubt to

be connected with and the remote effect of hereditary trouble. But certain features of the case under so general a statement extremely unsatisfactory. Indeed it only serves as a sort of stand point, from which one casts his eyes about with strong desire to know something of the ætiology of the case.

In the ordinary cases of Atrophy, let us say, for instance, of the variety of shrivelled pits in two or more teeth, with which every practitioner often meets, we are accustomed to be comparatively well satisfied if we can point out the fact that at a certain period in infancy, a constitutional disturbance interrupted the nutrition of the organ, either by a minus supply of lime salts, or an inability to appropriate the needed material. And that the shrivelled appearance of the structure is the direct natural result of this cessation, the normal formation being resumed on the subsidence of the constitutional affection. Especially so when our judgment of the time of this trouble is verified by the parent. It is quite possible we are too easily satisfied with the general definitions which Dental Science can only at present offer. Nevertheless, in that ease there seems to be in the cause assigned a complete adaptation to the production of the anatomical results which we find. True, we are still comparatively ignorant as to what are the precise changes of the structural constituents of the calcifying tooth which underlie this pathological condition. A generally received axiom now, however, as the result of the medical investigations of our times, to the identity of pathological phenomena with the phenomena of physiological life. " An examination of the anonalises of the osseous system, says Rindfleisch, reveals the fact that a large number of the diseases of the bone depend upon a simple plus or minus of normal growth. A far greater part depends upon the excessive prominence of individual anatomical forces which play a subordinate role in normal growth." So that a knowledge of the normal formation of bone from periosteum, and of the transformation of cartilage into bone, gives one the

foundation of the pathological histology, or *minute abnormal structural changes* of the osseous system.

With this key it is to be hoped that the study of the histogenesis of the teeth, both normal and pathological, may be prosecuted to a point as satisfactory and as thorough as in the nature of things it may be. But while in this case we have these common difficulties, there is apparently another and a coarser question added, pointing it would seem to a prominent local link. And it is this to which I here more particularly refer.

The question arises how we are to account for the production of enamel of inferior quality *uniformly* on the faces, cutting edges or prominent portions of the teeth, where at the age of 21 it is almost wholly destroyed, while the remaining portions clearly prove their better quality, in that they have successfully resisted all destructive agencies.

It is possible that an abnormal condition of the preformative membrane of Raschkow, which doubtless constitutes the bond of union between the enamel fibres and the dentine, may end subsequently in its loss, and thus favor the denuding process referred to, and account for the enamel color. But how vile this account for other and more prominent features of the case. Without however, entering into a review of the several causes of such a condition as may be suggested by those authors with which I am familiar, let it suffice here to say, that none of them appear to be adapted to the production of combined and uniform results, such as are exhibited in this case.

Is it possible that a premature attempt at root formation, analogues to premature ossification in bone which these produces disturbances in normal development, or rather, perhaps, a tardy enamel formation; or both may be a local or external cause of this diseased condition?

To be brief, that the formation of cementum by that elongated portion of the preformative membrane apparently invested with this office, taking place simultaneously with a late commencement of the enamel process, owing to con-

stitutional dyscrasia, and consequently the pressure of the teeth, however slightly, upon their walls during the incipient stages of enamel formation, may as a local cause so affect the young tissue on its face or front to produce these effects.

It would seem to be possible to have a disturbance in normal development here attended with an upward movement of the whole delicate structure, by the construction of the base of the dental sac, it may be; and that such disturbances may, in varying degree of intensity and continuance be the parent of various forms of disease in these organs.

It is deserving of some consideration in this connection that the effect of pressure on the occipital bone in rachitis is to impede and even in places to prevent ossification.

My mind has been led to the theory adduced by such considerations as these, viz:—

1. There are no continued or repeated constitutional disease, such as measles, scarlatina, etc., to account for such results.

2. If even it were conceded that repeated constitutional troubles were present sufficient to account for it, it would prove too much. It would leave unexplained the fact that the cutting edges, apices or most prominent positions of enamel, (commonly the least liable to loss because prominent,) are most defective, and lost, while those portions most liable to destructive processes remain sound.

2. Notwithstanding the different periods of development running through a term of years, we have the cutting faces or apices alone affected, and uniformly so.

4. It would seem that there must have been a common cause to act upon all alike, after some invariable law, one uniformly acting at the commencement of the enamel formation of each tooth, and acting upon a certain circular, well defined and limited portion of the enamel membrane, and to a point on the side of the tooth equi-distant from the apex in all.

5. The defective portion embraces only the whole actual

face or front of the tooth in advancing, *i. e.* the grinding surface and side swell.

6. The confinement of defect almost wholly to the anterior surfaces of some may result from the inclination and advancement of such teeth outwards as well as upwards. The molars and bicuspids are for the most part wholly encircled, and also the cuspidati.

SELECTED ARTICLES.

ARTICLE III.

American Dental Association.—CONTINUED.

FOURTH DAY.—*Morning Session.*

The Association was called to order by the President.

The report of the Treasurer was read and accepted.

The following resolution, introduced by Dr. Shepard, was passed unanimously:

Resolved, That the American Dental Association fully appreciates the promptness with which Dr. S. S. White responded to the requests of the dental profession, to take the management of the suit for the ascertainment of the rights of the public in regard to the use of vulcanite for dental purposes, and would respectfully request him to continue his valuable aid in carrying up the case for final adjudication by the Supreme Court of the United States, pledging him our moral and material support in defraying the expenses that may be incurred in the future.

A volunteer paper by I. Douglass, of Michigan, was read by Dr. Cushing, giving an account of two cases of apparent death from chloroform. The first case was that of a patient having palpitation of the heart, but no organic disease. After having twenty teeth extracted, the patient recovered consciousness, but immediately upon ascertaining the fact that the teeth were out, she relaxed and ceased to breathe. A battery which was near was immediately called into requisition, and with the first application the respiration and pulse appeared, and the patient made a speedy recovery. Fear had undoubtedly acted as an antidote to the chloroform, and the removal of that caused the syncope.

The subject of "Dental Education" was then taken up, and the report of the committee, written by Prof. McLain, of New Orleans, was read by Dr. Knapp. We give a synopsis of the report, as follows:

Of late years a gradual loss of confidence, amounting almost to distrust as to the efficacy of dental colleges, has taken place in the minds of leading practitioners; it is believed that graduation has become too facile, more from rivalry among the colleges than incompetency of the professors. No body of men has made greater pecuniary and personal sacrifices than these professors, laboring and expending money without either present or hope of future emolument. But the colleges have failed to meet just expectations; the profession looks to the colleges for the training necessary to place it in accord with the spirit of progression of the age. The colleges have been somewhat remiss in elevating the standard proportionally to our advance. One cause is the custom of examinations being conducted by the professors, who may allow sympathy to relax their rigidity, if not lead to partiality. Another cause is the practice of graduating students on attending two sessions, which is equivalent to making dentists in eight months of actual study. So limited a period is insufficient, coming unprepared as the student often does. Mechanics would consider a two-years' apprenticeship insufficient to

learn a trade; how can we expect that a knowledge can be gained in that time of a profession, involving high skill and acquaintance with several abstruse branches of science? The wonder is that the graduates are ever more than mediocre. Lack of previous education prevents the colleges from adopting a higher curriculum. Statutory enactments will not cure the evil as to colleges; but regulating laws would shut out the grosser and more reprehensible elements. What is needed is that the profession furnish the colleges with better material, and they should not accept pupils who have not a good preliminary education and natural fitness, and should obligate them to study three years and pass through a dental college. The colleges should confide the examinations to boards outside of the institutions, and thus avoid the charge of favoriteism. They should lengthen their courses to five or six months, and require an attendance of from three to five sessions as a condition of graduation. These measures are a matter of self preservation with the colleges, for at the present rate of increase, the profession will soon be overrun, and its remunerative prospects destroyed, and the reproach incurred would affect them injuriously. The first college adopting these measures might temporarily suffer, yet in the end it would be compensated and would gain the support of the profession.

Dr. Keely followed with an additional report, of which the following is a synopsis:

Dental surgery is a legitimate speciality of medicine, and should assume its true functions in the healing art, by the principles of which its processes should be controlled. Its basal elements are a thorough study of the whole organism,—and such knowledge is now required. Mechanical skill with a few general ideas are not now a preparation for dental practice; knowledge is power in this as in other branches. The medical profession has been cold toward us, and the fault is with it. Let the dentist demonstrate his worthiness, and this will disappear. Preliminary literary culture is demanded. The mind and heart must be trained.

Dental practice needs manhood as its basis. The college diploma is often a fraud, but so transparent as to deceive only the ignorant. What is truly represented by it is the least that should satisfy the student. It is of little importance whether the medical knowledge is taught in a medical or a dental college if it is well taught, and the preparation honestly and thoroughly made. The student is then prepared to appreciate his special branch of study, and his time will be saved for its higher elements. Impatient aspirants may turn away in disgust, and seek for a shorter road. Let such remember that the time for success in this way has passed; any scientific calling demands far more elaborate preparation than in the last generation. Daily requirements of practice call for a more advanced and scientific knowledge. A young man who rashly assumes these duties, condemns himself to a meagre share of the benefits of his calling, and exposes his patients to the consequences of his ignorance. The student should be under the direction of a preceptor who is competent, and of recognized skill, who will require from three to five years' study. A sensible preceptor will unfold to the aspirant his deficiency in any element of success, and give broad views of professional duty; will moderate his impatience to assume those duties. He will point out the vast number of ill-educated men sent forth from the rival medical schools, and deprecate this policy in the dental colleges. To swell the number of graduates, the standard of attainment must be lowered. There are schools which do not yield to this temptation, and their diplomas stand high, because they indicate a definite amount of preparation. The error of establishing a dental college in every great city should be avoided, and effort should be concentrated at a few points, say three or four, which will be ample for our whole country,—one east, one west, one south, and, when the time arrives, one on the Pacific coast; for this number an endowment could be easily secured. The professors are at present poorly paid, and obliged to eke out their subsistence by

professional labor. This interferes with the value of their instructions, which are sufficient to tax fully a first-class mind. No professor holds his position except at a pecuniary sacrifice, which should not be required. Our profession owes to them a debt of gratitude. This policy of concentration will ignore local interests, and provoke recrimination; but truth is ascertained only after sharp altercation. We should hold to the policy when its necessity is recognized in spite of the clamor raised by interested parties,—its necessity is obvious. By limiting the number of colleges, an endowment can easily be secured, and each professor can receive a competent salary; but by dividing our means on a number of starveling projects, we shall inflict the same evils upon our profession which our literary and medical institutions are now deploring.

The subject was then opened for discussion.

Dr. John Allen said that dental education embraced more than that education which comes from others; it also embraced that which each man gives himself. The failure of dental colleges to discharge their duties, or rather of graduates to meet the requirements of practice, is due to the want of this second education. They settle down into mediocrity because they have a diploma. It is self-education that enables men to get beyond others. A celebrated painter said he mixed brains with his colors; we should mix brains with our work. The artificial branch of dentistry has been neglected, and it is lower to-day than it was thirty years ago, though on the whole our profession stands higher.

Dr. Walker said no perfect brain is found in an imperfect body. Dental colleges should go a little farther than they have been going. We should have a knowledge of the system beyond the mouth, which will enable us to avoid breaking down and spending months to recuperate.

Dr. Taft. There are many obstacles in the way of thorough dental education. One rests with preceptors. Great care should be used in selecting students; inheren

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laws is going to affect graduates. The public opinion of dentists moulds the action of colleges. We have no standard. One school may take a stand that all will approve; another will sell its diploma for twenty-five dollars. We should take such a course that they will take a different stand from what they now do.

Dr. Butler. Diplomas should mean something. They are too cheap,—there are too many graduates. Would like students to graduate both at a dental and medical school and then they would not have too much knowledge. Does not think it is policy now to send a student to a dental school, no matter how good. Fault is found with both schools and graduates, yet there is a disposition to multiply colleges They ought to be simmered down to two or three, and faculties put in that are good for something, and endowed with a sufficient fund to give them good teachers. The best schools are those that give the students ample clinical instructions. The teaching of mechanical dentistry amounts to little,—we are not so far advanced in that department as we were thirty years ago.

Dr. Allport. A great deal can be said about this question, but the thing is to say something practical. It is easy to blame the schools, but not so easy to suggest some practical plan whereby a thorough education will be more general. There is a desire that dentistry should be regarded as a specialty of medicine, but the present course of instruction in either private offices or colleges is not the best to secure that end. The same course of study should be pursued that other specialists in medicine go through with; books are studied and lectures attended for three years; and the extra time is devoted to the study of the special studies; and these cannot be pursued until a general knowledge of medicine is obtained. The student of dentistry, on the contrary, simply takes a partial course of reading, and commences work in the laboratory; thus studying a profession and learning a trade all at once. No one expects a trade to be learned in less than three years' apprenticeship.

Certainly even mechanical dentistry requires as mueh preparation as that; and to properly practice all branches, a man must learn both a trade and profession in that time. The study and practice should be divided. Let the mechanical dentist confine himself to that branch, and let the dentist who treats diseases of the teeth become fitted as a medical specialist in a medical college; let him breathe the atmosphere of medical teaching; then we shall have done the same that is done to make ophthalmotologists and aurists. Designate mechanical dentists as you please, but drop the word *dentist* as soon as you can. We may have "dentologist" to designate those who operate on the natural teeth; the others may be called what you please, as "dentificer" or "dentician," but let them be called by different names, and soon they will be so recognized by the public, who will be better served than by the present practice.

Dr. Morgan is the oldest graduate belonging to this body, and feels entitled to be heard. There are entering the profession one thousand two hundred men each year, and of that number perhaps two- hundred and fifty attend lectures. If the students can be got into the colleges, it will be a great advance. Admits that the colleges are not what they should be. Much stress has been laid upon the time required. Thinks that when a student can pass the examination he should have his diploma, whether in one year or ten. In some institutions that is the mode of procedure. In the University of Virginia there are only three professors, yet a diploma from that institution is the highest recommendation a man can have in the South. They examine at the end of one, two, and three years, and when a man earns his diploma he gets it, on the ground of qualification, and not length of time. If we can get the dentists of the country connected with the associations, we shall remedy some defects in education. In Tennessee there are two hundred and fifty dentists, and only fifty belong to associations; the others are beyond our reach, do not take our literature, never mix with the profession, but squat down

in the little towns. If we could bring them in contact with the more advanced in the profession, there would be less difficulty about students. We were among the first to require every student to give at least two years' time, and graduate before they proposed to engage in practice. It has had a wholesome effect, though it has not been lived up to.

Dr. Wetherbee. Public opinion is arrayed against the advance of the profession. The larger part of the people are of moderate means, and call on the first man whose shingle they meet. There are many practitioners who are not properly instructed in the mechanical department; you cannot divorce this department from the operative generally. Some practitioners keep their students for years and never instruct them an hour, or allow them to see a tooth filled. No respectable dentist should take a student for less than three years, and should require him to agree to attend a college at the end of that time and graduate. This association is a stumbling block to our advance. It is composed of graduates and non-graduates. Change the constitution, and allow no delegate to come here who is not a graduate, and you will have set an example to the whole country.

Dr. McQuillen. In listening to the annual criticisms of dental colleges, in our national association, I am forcibly reminded of an utterance of that genial wit and humorist, the "Professor at the breakfast-table," wherein he says,—"When nature invented, manufactured, and patented her authors, she made critics out of the chips that were left." It takes time, labor and thought to write a good book, or to found, manage, and maintain a college; but with a breath or stroke of the pen slight faults can be exaggerated into great defects, and unfounded assertions of unfaithfulness to duty made without due examination of their authenticity. No one can be more conscious of the shortcomings and deficiencies of dental colleges than those who are managing them, and endeavoring, so far as they can with limited means and inadequate support, to increase their sphere of

usefulness. Do gentlemen appreciate the trouble, time, and expense that those who are engaged in teaching are subject to? Would it not be well, in addition to criticising these efforts, they would aid in the cause of education by contributing money towards endowing the colleges; or, better still, spend their time and money in establishing and maintaining dental colleges, and thus show the profession how much better they could do the work? Why not criticise private preceptors in their unquestionable failure to perform their duty? For the vast majority of accessions to the ranks of the profession come from private offices. The curriculum of instruction in the dental colleges, in place of being lessened, has been enlarged. Formerly a winter course of four months constituted the annual term; now, in addition to that, in some of the colleges, there are spring and fall courses of lectures, while the dispensary and laboratory are open all the year, where every opportunity is afforded for acquiring a practical knowledge of the profession without additional charge to the student. The standard of graduation has also kept pace with this. Speaking not from isolated cases or a limited experience, but as one having had every opportunity of observing the men who have attended lectures in the medical and dental colleges in Philadelphia during the past twenty five years,—the class of students entering and graduating from the dental colleges now, instead of being inferior to those of former years, are vastly superior in mental culture, for many of them have enjoyed every advantage in scholastic opportunities in the best universities of our own and foreign lands, prior to matriculating in our institutions. We are told that there should be fewer schools; that four would suffice, one in the east, one in the west, one in the south, and one on the Pacific coast. Has the gentleman considered the question in all its bearings? Colleges are established not merely to supply the wants of the present, but the demands of the future; not only to educate those who are to serve, in our land, forty millions of people in the present, but five

hundred millions in the future. Again, if all engaged at present in the practice of dentistry who need educating, and the yearly additions to the ranks of the profession who come in from private offices without an education, were forced by State laws or an enlightened public opinion to obtain a collegiate education, the dental colleges now in existence could not accommodate them; indeed, with the present facilities, the best arranged institutions in the country could not give that practical instruction which is such an important element in dental education to more than one hundred students; whereas, on account of the different methods of instruction in medical colleges, five hundred to one thousand men can be taught the theory and practice of medicine and surgery.

A most melancholy spectacle is presented by some of our fellows who are constantly whining about the non-recognition of the profession. The question naturally suggests itself,—is the fault with the profession or the individual? A man of culture, ability, and executive capacity has no occasion to complain of indifference to his rights on the part of others, and it is the influence of such men that gives character and tone to the profession in which they are engaged.

Dr. Crouse. To improve the profession we must improve its material; but he does not agree as to the superiority of graduates over others, Their average is very little above those outside. There is something wrong either with the material or the education when men associate themselves with the worst mountebanks in the country. There are some earnest laborers in the colleges; but the fact that when one college springs up in a city, another must spring up, shows that it is a kind of quackery. One set of men say that another set shall not be above them in being called college professors. Colleges can't educate one hundred properly. He would not send a student to any college, but would give him his dental education, and would send him to a medical college. A dentist should be a great deal

more than educated as a manipulator, and that can be done a great deal better in an office than in a college. We cannot expect to be recognized by scientific men, until we become scientific. To make dentists you must have the right kind of preceptors and the right kind of material.

Dr. Atkinson. Dental education is really very far off, if we have to go back through surgical, medical, and classical, to academic education before we can get it. Medical education is the basis of dental education. He has his ideal, but we have to take things as they are. Who of us that has come through all the painful labor, don't know the difficulty of getting what little education we have? If we were required to produce a voter twenty-one years old instanter, with a nice beard on, he don't know how it could be done; we will have to go back to the good old way, begin right, and very likely it will come out right. The mechanical aspect of dentistry, like surgery, enables us to perceive when we have coincided with law or opposed it. Medicine makes mistakes, and the grave covers them. The self-sufficient iconoclast tears valuable organs from their location, and puts them out of the way. I am with and against every man who has spoken; with him so far as he comes up to my conception of the truth; and when he don't I yearn to illuminate him, because I know I have the truth. Ain't *we* the gentlemen, and *they* the boors; ain't *we* the Christians and *they* the vandals the world over? What is education? It is mental feeding and nothing else; it is knowing what kind of food to eat. Sometimes I wish that there were no such things as diplomas. If there must be, do have them say what they mean, and mean what they say. Many in this room have them who never attended a single lecture, and yet they are worthy of them. They do not go through the right way, they say. The brave men who have practiced the self-education spoken of by Dr. Allen,—did they make themselves worthy? No; the blessed love of the fountain of light made them what they are; all they know was received at a time when they were

in a receptive condition, and were hungry to know, and the divine grace came in and illuminated their understanding, and revealed to them the truth. When we get hungry for a breath we take it; so when we want education very bad we get it,—where there is a will there is a way.

I wish there were nothing but certificates of advancement. Graduation will leave us but babes; we are not complete in our best apprehensions. Diplomas as a rule are a damage, for they entrap a man into the idea that he has been recognized, and has finished. That is not the intention. It is simply an admission fee to the show,—to where the divine grace may come in and possess him,—make him luminous, and perceive the truth, and then he will embrace it; for there is not a sinner on the earth that will go the way of darkness by preference, the whole pulpit to the contrary notwithstanding, and I am a *pulpiter* too. (Applause.) I am not ashamed of the meanest outside dentist as compared with the meanest outside medical man. I will cast my lot with the dentists; they have more goodliness as a class. Then how shall we get our education? By honestly seeking it, irrespective of how much it will cost. Although we claim to be Christians, we are almost to the last man of us playing Jew,—trying to buy cheap and sell dear. *E* (Greek,) out of, and *duco* (Latin,) to lead—a hybrid—a Greek-Latin mule that we are riding on. No wonder we tip over the fence, first one way and then another, half milk and half water. Give me hungry students. I can talk to them as far as I can see them. What we need is soul to soul communion, mind to mind interpenetration like the interpenetration of gases, until every one shall be satisfied and say *yes* from the bottom all the way up. When we know that the inquiries that arise in our own minds are satisfied, we are educated, and not till then.

Dr. Osmond. In spite of the poor compensation which professors receive, there are many who glory in the title. Many aspire to it who illy deserve it. Is in favor of a national board for the examination of students and also of

professors. A school is established by a few men who get together and obtain a charter; the professors are not appointed by the trustees, but the trustees by the professors; as a general thing, the trustees are simply a farce. Though the professor is not compensated, he stands before the public as a professor, and obtains better fees in consequence. Students are obtained by circulars, and by conferring honorary degrees to secure the influence of the recipients. In some institutions the professors buy in the stock and obtain control, in order that they may be everlasting professors in it.

In many cases the diplomas are bought. Let them be given to those that deserve them, and be without price and above suspicion. The professors should not examine the students; a board of the national Government should examine both them and the professors. Some of the worst quacks are graduates,—laughing-gas and rubber quacks. One graduated, to the speaker's knowledge, after a three-weeks' session, who had never pulled a tooth in his life until ten months before; in four months he sold twenty-one pwts. of gold which he had taken from teeth he had extracted. Over such shops should be written Dante's motto, "All hope abandon, ye who enter here."

Dr. Watt. Is not now connected with any college, though he had once been, both as student and teacher; in that institution great care was taken that the students should give evidence of moral character and manly disposition. Some proved derelict afterwards,—but there is no professional or classical institution that has not had the same experience. One year the questions were printed, and the student had no opportunity of knowing what they were to be, and the examinations were lengthy and rigid. His alma mater has been about as much disgraced as any; one of its graduates is advertising to do rubber work for eight dollars.

Dr. Rehwinkel. Dental colleges have been very severely criticised, but do we do our duty as educators, as a body, and in societies? These last alone have been the means of

bringing our profession up to its present standpoint, though many go away from them disappointed. We are all of us teachers in the true sense. A different course will be pursued by dental colleges at some future day. They will be made to feel that they have given grounds for disappointment, and the profession will see that they have failed to encourage and sustain them. Preceptors are remiss, and the colleges, have to go down and commence from the very foundation for want of a preliminary education, and in many cases the student must unlearn what he has learned. In Germany, public opinion is much divided; some insist that the student shall go to a medical college and become an educated physician. There is a sharply drawn distinction between those who have diplomas and those who have not. *Dr.* A. may be no better dentist or operator than *Mr.* B., yet the latter is cut off from speaking in an assembly of this kind. Others there, especially those who have more thorough knowledge of this country, favor the American system, and point with force and truth to the fact that, so far as accomplished operators or manipulators are concerned, the Americans are far in advance, and claim that they stand as high in scientific attainments.

Dr. Butler offered the following, which was adopted:

Resolved, That it is the opinion of the American Dental Association, that the time has fully come when degrees should not be conferred by dental colleges upon any student who has attended but one course of lectures.

Adjourned.

Afternoon Session.

Met pursuant to adjournment.

On motion of Dr. Judd, it was resolved that the "Transactions" of former years now on hand be given to members of the profession who may call for the same, and the remainder be donated to local societies who will pay the cost of transportaion; (Drs. L. D. Shepard, Boston; W. H. Goddard, Louisville; A. M. Leslie & Co., St. Louis; and M. S. Dean, Chicago, may be applied to for these volumes of "Transactions."

The Nominating Committee reported the following list of standing committees, who were unanimously elected:

Physiology.—J. H. McQuillen, E. S. Gaylord, J. R. Walker.

Pathology.—H. Judd, L. D. Shepard, J. S. Knapp.

Histology and Microscopy.—J. Taft, E. D. Swain, W. H. Jackson.

Chemistry.—H. A. Smith, S. B Palmer, J. S. Cassidy.

Therapeutics.—E. A. Bogue, W. O. Kulp, C. C. Canine.

Operative Dentistry.—G. H. Cushing, C. S. Stockton, S. H. McCall.

Mechanical Dentistry.—F. H. Rehwinkel, J. F. Canine, J. Johnston.

Dental Education.—G. W. Keely, A. H. Brockway, S. Welchens.

Dental Literature.—J. S. Knapp, L. G. Noel, C. D. Cook.

Etiology.—H. S. Chase, E. C. Hawxhurst, C. S. Smith.

Prize Essays.—I. Forbes, G. L. Field, R. B. Donaldson.

The regular order of business was resumed, and the subject of dental education was further discussed.

Dr. Horton. We should not criticise too harshly in this matter except in the spirit of liberality. Daniel Webster, it is said, tore his diploma to pieces upon the platform at his graduation, and told the faculty that he would not build upon it, but would build npon his own foundation. We know what his reputation was. It is not necessary that we should have a diploma; if we have the knowledge we need not fear being recognized. Will stand with Dr. Atkinson with the dental profession. The dentists will stand favorably as compared with medical men everywhere.

Dr. Judd. If we are not specialists of medicine, what are we? As to whether we are recognized as we deserve, has views different from those that have been expressed. When we take a fair view of the subject, we have no right to complain. The National Medical Association requires that its delegates shall be medical men; if that body should

see fit to send a delegate here who was not a practicing dentist, we should reject him. A few journals have sought to throw discredit upon the dental profession, but the great body of physicians recognize dentists to the fullest extent they have a right to demand. If they recognized all of us as polished physicians, they would make a mistake; but they are anxious that we should educate ourselves generally, and stand upon the same footing as oculists and other true specialists. If we desire to be specialists, we should make ourselves such; educate ourselves as medical men; and the best way to do it is in a medical college. The medical profession appropriates the best materials as teachers, and if we desire that education we must get it where the best teachers are employed. If there is a prejudice against us, how shall we eradicate it better than by allowing our students to sit side by side with them, and show that we are their equals? The colleges have done a great work, but are not all that they ought to be. This discussion will have a great deal to do in shaping their future course, and will improve them. This Association should keep a close eye upon these institutions, and eventually control them. Some schools are kept up for the benefit of the professors, and therefore the control of the institutions should rest with the profession at large.

Dr. Bogue offered the following:

Resolved, That it is the sense of this Association that no dental student should be graduated by any dental college without at least three years instruction, including private pupilage and college instruction; the latter should in no case embrace less than two regular courses.

Resolved, That this Association suggest to the different colleges of the country to appoint a common Examining Committee, consisting of five members, none of whom shall be in connection with any dental college, whose duty it shall be to examine all applicants for graduation, and decide upon the same.

Dr. Judd offered the following;

Resolved, That this Association recommends to all local societies the adoption of rules prohibiting their members from taking students for a less period than three years, or for such a time as will complete a three years' pupilage.

These, by vote, were laid over one year.

The committee to co-operate with Dr. S. S. White in defending the rights of dentists against the Vulcanite Company, being called upon, Dr. Judd made a brief report. The thanks of the Association were voted to the committee, and it was continued.

Dr. Knapp offered the following:

Resolved, That the thanks of this Association are due, and are hereby tendered to the Michigan State Dental Protective Union for the energetic, and so far successful manner in which its officers have resisted the claims of Josiah Bacon and the Goodyear Dental Vulcanite Company. Carried.

Dr. Allport offered the following amendment to the Constitution:

"That the American Dental Association will hereafter admit no delegate who shall enter the profession without first having graduated at some reputable medical or dental college."

Laid over till next year.

The committee to prepare a circular for the information of the public on the subject of "Care of the Teeth," requested further time. Granted.

Dr. McQuillen gave notice of a proposed change in the By-laws, making twenty-four members a quorum.

The newly-elected officers were then inducted into office by Drs. Morgan and Allport.

The report of the Committee on "Mechanical Dentistry," written by Dr. Swain, was then read. The following is a synopsis:

The report noticed no improvement during the year, and indeed stated that the novelties of the year were almost utterly worthless, of which vulcanizable gutta-percha was

quite so. The metallic alloys have failed to come into general use. Rose pearl, owing to its complicated method of manipulation, has not grown into general favor, although it appears to possess the properties of a durable base. Celluloid has grown greatly in favor on account of its simplicity of manipulation, and is quite extensively used.

It is a better conductor of heat and cold than rubber, and gives better adaptation to the parts. Aluminium, which promised so well, has been proved to lack durability; in alkaline mouths it is easily destroyed,—blister-like spots appear in contact with the mucous membrane, which soon become holes. It may be owing entirely to impurity of the metal. If this is the case, we have a metallic base in many respects superior to all others. Many of the objections to rubber may be obviated by using the black variety, which contains no vermilion, and is stronger. No improved machinery for the laboratory is noticed except the steam celluloid apparatus, and Hopkin's regulator for the vulcanizer, which automatically turns off the gas at any desired length of time. The report entered a protest against the proposed separation of the mechanical from the operative department of dentistry, particularly the plan of leaving it optional with the student in college whether he shall become proficient in the mechanical department. The profession is desirous of improving in this direction, as is shown by articles in the journals on improved methods of setting pivot teeth, and the efforts to produce a substitute for vulcanite. We are dissatisfied, and there is no reason why the colleges should at this time throw obstacles in the way of advance. The two branches, except in large cities, and even there only partially, can never be separated by the general practitioner. The college which graduates a student incapable in this direction, not only does the individual an injury, but possibly a community. An ambition to excel in this direction would soon make an advance. This department is not to be elevated by being made a specialty. The man who cares for the teeth of a family is the one to

replace them when lost. The teachers in our schools, and those who pride themselves on their ability to restore, are the men to elevate this almost dead arm of dentistry.

The hour for adjournment having arrived, the remainder of the subjects were passed, and the association adjourned to meet at Niagara Falls, on the first Tuesday of August, 1875.

ARTICLE IV.

Diseases of the Enamel.

BY HENRY S. CHASE, M. D., ST. LOUIS, MO.

Notwithstanding the compact structure of this substance it is in early life subject to inflammations and malnutrition; and at a later period, though not manifesting the same signs of inflammation that is exhibited in soft tissues, yet it undoubtedly goes through some of the movements which result in inflammation and death of the tissue.

During the development of the permanent teeth and before eruption, or even after eruption, all those portions of the dental crowns which are still covered by the gum, or within their respective sockets are peculiarly liable to be injuriously affected by eruptive disease accompanied by much fever. Scarlet Fever, Measles, and Small Pox leave their impress upon the enamel with great certainty. The enamel organ participates in the dermoid inflammation, and the enamel prisms cannot by any possibility escape. The delicate sheath which envelops every prism, being of the same histological structure as the enamel membrane itself is easily affected, and every prism may undergo inflammation. These delicate sheaths constitute the *basal* structure of the enamel. It is into these cells the fluid phosphate of lime is invested and becomes crystalized. Upon the severity and extent of the inflammatory process depends the appearance and physical condition of the enamel after the tooth is erupted.

Let us keep in mind that at this period cell life is in its greater activity, every thing is in motion; work is going on incessantly in every organ, and every tissue. *Building* is in progress; but if the workmen are sick, the process is arrested. When there is general disease the appetite fails; digestion suffers; food is not made into pabulum, protoplasm is deficient, and there are no *materials* for building, even if the builders were able to work. So *here* if nutrition is arrested then absorption will predominate, and a line of depression show around the tooth after its eruption. This will depend on the length of time during which the development of the organ was arrested, and whether wholly, or partially so. Wool of sheep; hair, and nails show the marks of defective, or arrested nutrition, caused either by sickness or want of food.

I have to day, July 15th, the depression or groove running across each thumb nail caused by a fortnight's sickness in March. The depressions or shallow grooves so often observed running across the incisor and other teeth, are the result of arrested development. The white, soft, chalk like spots on the enamel are caused by inflammation of the enamel cells, or sheaths of enamel columns, while yet the phosphate of lime was uncrystalized. Stasis resulted, and the lime in that chalky enamel to day is not crystalized; consequently there is no firmness or density to the tissue.

That enamel which appears seedy, or granular and still hard, was produced by inflammation and shrivelling of the enamel membrane, after the enamel cells had crystallized their contents.

In healthy and naturally developed enamel there is a circulation of the plasma of the blood through every enamel cell membrane, not by vessels, of course, but through osmotic action, such as takes place in every part of the body, at a greater or less distance from arterial vessels. To deny this is absurd.

In every portion of the body there is a territory outside of any nutritient canals, which is constantly importing and

exporting products. The activity of these motions depends much on the age of the individual, for it is well known that as age increases, nearer and nearer a static condition is reached, which at last may become perfect in some of the hard tissues, and especially in the enamel.

It is important to keep this in mind when we are making observations upon the teeth after eruption.

Every experienced observer knows that all of the hard tissues of the teeth are in a state of mobility before the fifteenth year, and I shall say, for a long time afterwards. The enamel has not upon its exterior that vitreous appearance that it has later in life. This may be owing to the more perfect crystalizations of the lime salts at a later period. As we extend our investigations deeper into the enamel substance towards the dentine we find less and less compactness, for that portion lying next to the dentine hardens later than the exterior portion. The exterior is always in advance of the interior; the same remarks will apply to the dentine, but in the later nutritive changes take place to a greater extent, and more rapidly than in the enamel, just as might be expected, for it is a softer tissue. A large number of observers have demonstrated that absorption often takes place in the dentine, and a much smaller number have demonstrated that it does, in rarer cases, in the enamel itself. We have seen that inflammation of the enamel membrane before eruption causes necrosis of that tissue, and now we wish to see how that pathological result may be observed to take place in the already erupted tooth. Let me tell you what I have hundreds of times seen and then we will try to arrive at a theory which will explain the phenomena. I am looking into a fifteen year old mouth and I see the anterior surface of a right under first molar. It is smooth and vitreous in appearance, and has no abrasion or crack on its surface, but there is a whitish spot about the centre of its surface. It is "off color." It has lost its polish; it cuts like rock salt; as I penetrate further it cuts easier until I arrive at the dentine, which is as hard as we find it at eight years after eruption.

I see the same tooth in the mouth of a person aged twenty. The spot is *brown* instead of white, it has a vitreous surface, smooth and without sign of disintegration. It cuts hard at the surface but immediately the thickness of tissue paper is cut through, the enamel is found friable, chalky to the feeling, and when the dentine is reached the latter is found more or less *softer than natural*, apparently decalcified, and a circumscribed cavity is formed, bounded by harder tissue.

I see the same tooth and surface in the mouth of a person aged twenty-five. The spot is black, vitreous surface; no disintegration. The blackness penetrates the enamel, shading off into dark brown until it reaches the dentine, where it still shades off into lighter brown, until the natural color of healthy dentine is reached. This black spot vitreous in hardness and polish, cuts at first like very thin feldspar but grows less dense, not seeming porous, as I go in, then becomes granular, and when the dentine is reached it cuts something like hard wood across the ends of its fiber, shading off into normally hard adult dentine. The previous condition of this tooth was that of pressure, caused by one now extracted. I have observed so many cases of this kind that I can attribute the pathology to nothing but necrosis of the enamel, caused by pressure, followed by stasis of circulation in enamel cells; a similar condition being caused by inflammation extending to dentine tubes, and decalcification of dentine previous to necrosis of the latter substance.

Sponstaneous abrasion, or denudation can only be fully explained by a *theory* which covers the ground which I have gone over, namely that vital action plays an important part in all pathological conditions of the dentine and enamel.—*Missouri Dental Journal.*

ARTICLE V.

Extensive Destruction of the Soft Parts near the Angle of the Mouth, from Sloughing after Fever. Plastic Operation; Recovery.

BY ROBERT T. GODFREY, M. D.,

Professor of Surgery, University of Bishop's College, Lennoxville, Attending Surgeon, Montreal General Hospital.

The following case was admitted into the Montreal General Hospital on the 13th July, 1874, and as it illustrates the beneficial results of plastic surgery, I deem it of sufficient interest to lay before your readers. The history as given by the patient himself is as follows:

William Bouchet, æt. 19, a French Canadian: a strong, well proportioned young man,—some two years ago suffered from an attack of "Typhoid Fever." He was ill for several weeks. In the course of his illness, and towards the close of the fever, his face became inflamed, he suffered much pain of a burning character, soon an ulcerated spot occurred, and the whole of the cheek separated and fell out; subsequently his teeth loosened, both in the upper and lower jaw, and were taken away by his doctor, together with several pieces of bone; he made a very slow recovery. Upon examination I ascertained that nearly the whole cheek on the left side had sloughed. The buccal cavity was completely absent. The molar teeth in the upper and lower jaw were gone, as well as a large portion of the alveolar processes. The integument was adherent to the bones of the face, and there existed a large opening the size of a crown piece, through which could be seen the tongue and the soft palate. The motion of the jaw was limited, and although he was quite able to pass into his mouth a good sized ball of food he could not masticate properly. He experienced great difficulty in guiding his food, when masticated, into the pharynx, as it would pass out through the opening unless prevented by his hand. This rendered him very miserable,

as anything like liquid food would run down his jaw and the side of his neck, and occasionally produce excoriations. The lips were entire; the angle of the left upper lip was curved upwards and inwards and was attached to the superior maxilla, while the lower lip curved downwards and was attached to the inferior maxilla. At the upper and outer part of the gap there exsted an opening into the antrum, which was quite visible. Looking at him from the injured side his appearance was very revolting. The poor fellow had to keep the part covered with a pad of linen to prevent the saliva from flowing down the side of his face and neck.

On the 21st of July I performed the following operation. The patient was placed under the influence of chloroform, and with the able assistance of my colleague, Dr. McCallum, I commenced by paring very freely the edges of the aperture. The integuments were then separated from their attachments to the superior and inferior jaw bones. The angle of the upper lip was freed, and the lip itself separated from its attachment to the incisive fossa; this gave ample room and the lip came down to its natural position without any dragging or strain on the nose. A large flap, semilunar in shape, was then taken from the integument situated over the body of the inferior maxilla and submaxillary space; this was perfectly freed and came up and fitted the aperture. The angle of the flap, somewhat V shaped, filled a similar shaped space which was left after turning the upper lid downwards. The angle of the mouth and the angle of the flap were fixed in their places by hare-lip needles with the figure of eight suture. The edges of the rest of the wound were retained in situ by wire sutures. The flaps were so freely separated from their busy attachments that there was no straining of the parts, which greatly conduced to the success of the operation. On the fourth day the needles were removed, the sutures were, however, allowed to remain. He had on the following day a slight attack of erysipelas, which was relieved by the usual means. From this time all progressed favorably.

The sutures were not removed until firm union had taken place. The patient left the hospital on the 8th of August, eighteen days after the operation. The accompanying engravings are from photographs by Notman, and give a most faithful representation of the appearance of the patient both before and after the operation.

EDITORIAL, ETC.

Annual Commencement of the Baltimore College of Dental Surgery.—The *Thirty-fifth* Annual Commencement of this institution will take place on the evening of February 25th, 1875, at the Concordia Opera House, Baltimore City, and the indications are that the Graduating Class will exceed in number that of last session.

The Alumni and Friends of the College are very cordially invited to be present, not only at the commencement exercises, but during the final examination of the candidates for graduation, which takes place during the week preceding the Commencement.

The Faculty feel assured that the course of study and requirements, as well as the result of the examinations, will convince all honest minds, that not only a very marked improvement has been brought about by the officers of this College, in their endeavors to elevate the standard of dental education, within the past five years, but that this, the oldest Dental College in the

world, still maintains its world wide reputation, and while it is far superior to many of recent growth, is second to none in this or any other country.

The Faculty invite all interested in dentistry to visit this institution in order that they may, after like visits paid to others, be able to make a fair comparison, and no longer be deceived by false statements which generally accompany incompetency and failure.

As an evidence of the desire of the Faculty of the Baltimore College of Dental Surgery to do every thing in their power to advance the interests of dentistry, and maintain and elevate the status of their institution, they take pleasure in announcing that as soon as the present session terminates, this College will be removed to the handsome four story building with mansard roof, which has just been completed for the purpose, on the South-East Corner of Lexington and Eutaw Streets, one of the best locations in the city of Baltimore; and they can now truthfully say that it will be the most elegant and best arranged Dental College in the world.

Its location possesses every advantage for securing a larger Infirmary practice than even now exists, and the friends of the College are invited to visit the new building and judge for themselves.

It will also be gratifying for them to learn that the number of students in attendance at the lectures of the present session is larger than that of last session.

Dentes Sapientiæ.—Dr. Jno. H. Coyle, of Thomasville, Ga. sends us two diminutive teeth of this class, which are of interest as anomalies, accompanied by the following history:

"In November last a young lady aged about 21 or 22, applied to me to have her upper teeth extracted with the view of having them replaced on a plate. I extracted the teeth and roots corresponding to 14, and found that neither of the Dentes Sapientiæ had been erupted. Eight days after the extraction, (all having been completed at one sitting,) she returned saying that I had left two roots. Upon examination I found the enclosed rudimentary Dentes Sapientiæ hanging to the gum, where the two second molars had been removed. I removed them

with my fingers. You will observe one of them is perfect *in form* and apparently so in structure, while the other is almost destroyed by caries. If you deem them of sufficient interest you can place them in the Museum of the Baltimore College of Dental Surgery."

A Toothless People.—Under this title the following appears in some of our medical exchanges, which, if part at least be true, is a good lesson to those who require to become wiser through tribulation. We have very little sympathy for such people, when we know that in and about Warrenton, Va., there are several excellent practitioners of Dentistry:

"A few weeks ago a dentist came to town and advertised that he would 'remove all of a person's teeth for two dollars and insert a new set for ten dollars, besides giving six months' credit.' The Warrenton people are very fond of bargains, so there was a rush for the dentist's office. He was busy for two weeks pulling teeth, and at the end of that time half the people had empty gums, and a bone-dust factory in the neighborhood doubled its workmen so as to grind up the teeth.

"Meanwhile the people were waiting for the dentist to fit them with new sets. The abandoned scoundrel eloped with the hotel keeper's wife, and now there are two or three thousand people in town who cannot eat anything tougher than soup and farina. All the butchers have failed, and not a cracker has been sold for three weeks. One man, it is said, whittled out a set of wooden teeth for himself, but the first drink of whiskey he took—Cincinnati whiskey—set them in a blaze, and his funeral came off next day. The dentist will hear of something to his disadvantage if he comes back."

Correction.—Editor Journal.—*Dear Sir*: In your report of the proceedings of the American Dental Association, (Jan. No. page 409,) your reporter makes me say, "Saliva has, as is well known, the power of converting phosphate of lime into grape sugar."

I said Saliva had the power of converting STARCH into grape sugar.

You will greatly oblige me by making this correction in the next issue of the Journal.

Respectfully and truly yours,

Nashville, Tenn., Jan. 13*th*, 1875. L. G. NOEL.

MONTHLY SUMMARY.

On the Treatment of Wounds.—Dr. G. M. Humphrey, at the recent meeting of the British Medical Association, presented [*British Medical Journal*, Sept. 19, 1874] a paper upon this subject. Cut surfaces, he said, seldom fail to adhere together and grow together—that is, to unite by first intention—if they be kept in apposition, however much they may have been exposed to air, as in wounds of the face, scalp, and fingers, where this may commonly be done. This, therefore, is the great desideratum. The obstacle to it is the accumulation of bloody-fluid in the wound keeping the surfaces apart, decomposing, and causing suppuration. No precautions hitherto have assured against this. Anything giving that assurance would be a most valuable discovery. The decomposition may be lessened sometimes, though not commonly prevented, by antiseptics, but fail to provide for escape by drainage. Professor Humphry had long adopted the plan, which he had brought before the Association at the Cambridge meeting in 1864, of approximating the edges by sutures, and leaving the wound quite uncovered and dry. No dressing being used, the pain of removing and re-applying plasters, etc., is avoided. This, combined with some antiseptic or blood-coagulator to the surface of the wound, and a space left for escape of bloody-fluid, was, he believed, the mode most likely, on the whole, to promote quick union of large deep wounds. He did not think that torsion of vessels or carbolized ligatures presented much advantage over the hemp ligature. A splint was an adjunct that might well be oftener used. He had tried the hydrate of chloral [five to eight grains to the ounce of water,] and found it a valuable disinfectant, and

recommended others to try it. In the case of wounds for the removal of cancer, he had for many years encouraged suppuration, and tried to retard healing, believing that this tended to delay the return of the disease. In some cases, he had inserted issues at the time of the operation or subsequently, and he thought with benefit. He believed the administration of opiates to be generally prejudicial in treatment of wounds.—*Abstract of Medicine and Surgery.*

On Salivary Fistula.—In a recent number of the *Gazette des Hopitaux* (p. 814) is the account of a patient who was exhibited to the Academie de Medecine after the cure of a salivary fistula. He was a boy aged twelve, who fell in running down a staircase with a chamber-pot in his hand. His cheek was cut, and three fistulous openings formed—one corresponding to the situation of Sten'o duct, which showed no tendency to heal, the two others situated over the gland itself closed spontaneously. An artificial canal was formed through the cheek, by means of a trocar, and kept dilated with tents and bougies. When this canal had been completely established, the wound was closed by twisted suture. The cure at the time of exhibition [more than three months after the accident] seemed complete. During the presence of the fistula, Dr. Prompt, his medical attendant, made several observations on the boy which led him to the following conclusions.

1. The discharge of parotid saliva depends on the excitation of the sense of taste, and is pretty nearly the same whatever be the form of that excitation, whether the person eats or drinks, or a sapid substance is applied to the tongue.

2. The quantity of the liquid secreted depends chiefly on the time during which the excitation of the sense of taste lasts: thus, if a glass of wine is swallowed at once, only a few drops will be secreted; if it be drunk in small mouthfuls, so as to spend three or four minutes over it, a considerable quantity, as much as two or three grammes, will be obtained.—*London Med. Record.*

Neuralgia of the Lower Jaw and Tongue treated by Excision of the Nerve.—Dr. Theo. A. McGraw, of Detroit, reports the case of Mr. H., of Fairbault, Iowa, who had suffered for several years from a neuralgia of the left side of the tongue and lower jaw, which was becoming more and more constant and severe. The agony was so great that he was at times prevented from talking or eating. He had tried every remedy of which he had heard, and came to Ann Arbor, in the winter of 1871-72, to have the nerves leading to the painful areas excised. I saw him first in

January, 1872. I examined him carefully, to find, if possible, a cause for his terrible suffering. The teeth had been for the most part already extracted, and the gums seemed sound and natural. Careful investigation failed to reveal any eccentric cause of irritation, and I finally yielded to his desire, and operated upon him, in the hope that the disease might have its seat in the terminal nervous filaments. I performed the operation in the presence of the medical class, and by the assistance of Dr. Frothingham, on the third of February, 1872. I cut down upon the ramus of the lower jaw, splitting the masseter muscle and pushing its fibres aside. I then trephined the bone at the point where the inferior dental canal begins, and excised through the opening about half an inch of the inferior dental and gustatory nerves. The patient did well and recovered.

"I wrote to him a few weeks since to inquire as to the final result, and learned that he had remained free from pain for fourteen months. In April of 1873 it began to return, and now he describes it as bad as ever."

Dr. McGraw, in reviewing this case, says, "it is evident that the seat of the neuralgia is in this case somewhere in the peripheral nervous filaments, although no disease of the tongue or jaw could be discovered by the eye or touch. The recurrence of the pain in April, 1873, would indicate that a regeneration of the nervous tissue had taken place at that time, and that the nerves had then begun to resume their functions. I have advised the patient to have a tenotome passed through the jaw at the spot where it was trephined, and have the nerves redivided. It would seem as if some process by which the nervous regeneration could be prevented in these cases ought to cure neuralgia of this description.

"I have been pleased with a suggestion of Dr. W. H, Stevens, of Fairbault, respecting neuralgias confined to the jaw alone. The doctor suggests that the dental canal be plugged wiih gold after the division of the nerve, thus making its regeneration impossible."—*Detroit Review of Med. and Phar.*

Richardson's Tooth-Edge Cutting Scissors.—These scissors are intended for the removal of tumors, and for general use in any operation where it is desirable to avoid much hæmorrhage. They are particularly suitable for cases of epulis. They are of the ordinary construction in all respects except in the cutting edge The cutting edge of each blade, instead of being even and sharp is divided into finely-pointed teeth, each tooth being directed with a slight inclination towards the handle of the scissors. When the blades meet the teeth cross each other. and as they pierce any structure that may lie between them, they crush also,

between their surfaces. If a piece of moderately firm substance be placed between the blades—a piece of paper or thin card, for example—the scissors perforate it in a series of perforations resembling what is seen in the postage stamp—that is to say, they do not cut clean through the substance so as to leave it in two distinct parts at once. A little lateral or half-rotating movement of the closed blades is, however, sufficient to tear through the still connected lines of substance and to complete the separation. The same occurs if the substance placed between the blades be a portion of soft animal structure, only that more force is required in the lateral or rotating movement to cause complete separation. The parts punctured are crushed between the teeth, and are separated by the twist or torsion. I find these scissors useful in dividing directly and quickly structures in which there are many minute blood-vessels, and which, when divided by the knife, bleed freely. These toothed scissors, as they can be made at one and the same time to pierce, crush, and twist, control bleeding remarkably.—*Lancet.*

Disinfectants.—Take a shallow and broad saucer and partly cover it with chloride of lime, then pour upon it a half ounce of impure carbolic acid. To fumigate rooms after death, to the above add a little strong sulphuric acid. Carbolic acid is not now regarded with so much favor as heretofore; it is disagreeable and irritating to the lungs; it impregnates the food, and neighbors are annoyed by its odor.—*American Medical Weekly.*

A Simple Plan of Ventilation.—The following simple method of ventilating ordinary sleeping and dwelling-rooms is recommended by Mr. Hinton in his "Physiology for Practical Use:" "A Piece of wood, three inches high, and exactly as long as the breadth of the window, is to be prepared. Let the sash be now raised, the slip of wood placed on the sill, and the sash drawn closely upon it. If the slip has been well fitted, there will be no draft in consequence of this displacement of the sash at its lower part; but the top of the lower sash will overlap the bottom of the upper one, and between the two bars perpendicular currents of air, not felt as draft, will enter and leave the room." —*Druggists Circular.*

Moth Preventive—The following recipe for keeping moths out of clothing is a favorite in some families: Mix half pint of alcohol, the same quantity of spirits of turpentine, and two ounces of camphor. Keep in a stone bottle, and shake before using. The

clothes or furs are to be wrapped in linen, and crumpled-up pieces of blotting paper dipped in the liquid are to be placed in the box with them, so that it smells strong. This requires renewing about once a year.—*Druggists Circular.*

Colored Inks.—The following recipes have been well tested and are commended by good authorities as preferable to the solutions of aniline dyes which are now so extensively used as colored inks:—

Green. Two parts acetate of copper, one part carbonate of potash, and eight parts water. Boil till half is evaporated, and filter.

Blue. Three parts Prussian blue, one part oxalic acid, and thirty parts of water. When dissolved, add one part of gum-arabic.

Yellow. One part fine orpiment, well rubbed up with four parts thick gum-water.

Red. With the aid of a gentle heat, dissolve four grains of carmine in one ounce of aqua ammonia, and add six grains of gum-arabic.

Gold. Rub gold-leaf, such as is used by book-binders, with honey, till it forms a uniform mixture. When the honey has been washed out with water, the gold powder will settle at the bottom, and must be mixed with gum-water in sufficient quantity.

Silver. Silver-leaf treated in precisely the same manner gives a silver ink. Both these inks may, when dry, be polished with ivory.

Black. Three ounces crushed gall-nuts, two ounces crystallized sulphate of iron, two ounces gum arabic, and twenty-four ounces water.

White. Fine French zinc-white, or white-lead, rubbed up with gum-water to the proper consistency.—*Boston Jour. of Chemisty.*

How to Remove Brass or Gold Rings from the Finger.—Dr. Wm. Hauser recommends for the removal of gold rings the pouring of quicksilver over the ring. An amalgam is instantly formed, and the ring can be readily snapped by pressure with the fingers. To remove a brass ring, melted wax is poured all over the ring, enough to fill up all the gaps between the ridges on the afflicted finger. The wax is made to run under the finger also, to insure full protection to the skin. Then by a knife a small hole is made in the wax down to the ring, and muriatic acid poured into this hole. In a short time this will have combined with the elements of the brass. The ring can then be broken by pressure.—*Atlanta Med. Journal.*

Nelaton's Method of Resuscitation from Chloroform Narcosis.—Dr. I. Marion Sims (*British Medical Journal,* Aug. 22, 1874) most impressively details his observations respecting the practical workings of the above method. Briefly stated, it consists of in reversing the body of the patient, either by hanging him up by the feet or laying him over a bed or table, so that the blood from the greater part of the body can gravitate towards the head. The tongue is drawn forward by a tenaculum and artificial respiration tried. This practice is based on the theory that death from chloroform takes place from cerebral anæmia. —*Detroit Review of Medicine.*

External Application of Iodine.—Dr. Laborde strongly recommends M. Bouvier's formula for an iodine paint, to be applied externally. It consists of 30 parts of tincture of iodine, 2½ parts pure iodine, and 1½ parts of potassium iodide. M. Bouvier employs this paint in Pott's disease, along the sides of the spine and over the congestive abscesses, so frequently met with in this disease. But M. Laborde finds that it is most useful in serious effusions, as in simple hydrarthrosis, in rheumatic or traumatic effusion into joints, in hydrocele, etc. Even in simple pleuritic effusion it is very serviceable, not indeed in the early stage, but when this is confirmed. It may also be employed in certain congestive states of the viscera, especially in congestion of the liver, acute hypertrophic cirrhosis, and the accompanying ascites. He is accustomed to cover the painted part with a thick layer of cotton-wood; and he points out that it is easy to incorporate with it various calmative remedies, as morphia, opium, and belladonna. It then becomes very useful in relieving the pain of sciatica.—*Bulletin General de Therapeutique.*

Passage of Arsenic and Antimony into the Tissues and Secretions.—MM. Mayencon and Bergeret have discovered that arsenic and antimony can be readily detected by converting them into their hydrogen compounds and allowing the gases to come in contact with a piece of test paper dipped in perchloride of mercury. Arseniuretted hydrogen causes a citron yellow stain on the paper, and antimoniuretted hydrogen a greyish-brown stain. They detect arsenic in the urine of a person taking it by putting about an ounce of the morning urine in a flask with a piece of pure zinc, pure sulphuric acid, and a little sugar candy, and then placing the paper soaked in mercurial solution on the mouth of the flask. By this method they find that arsenic is rapidly absorbed, and appears in the urine immediately. It is some time before its elimination is completed. When no more appears in the urine, but some remains in the body, sulphurous

waters aid its complete expulsion. Antimony is absorbed and diffused in the organism more slowly, and its elimination by the urine rarely begins on the first day, and generally only does so after it has been given for several days. Experiments on animals show that arsenic and antimony are eliminated both by the liver and kidneys, but chiefly by the liver.—*La France Medicale.*

Weight of Men and Women.—At the late Franklin Institute Exhibition there were weighed 15,840 men, aggregating 2,314,260 pounds; 17,437 women, aggregating 2,249,370; making the average weight of each man 149¾ pounds, and of each woman 129 pounds.

Anæsthesia by Injection of Chloral into the Veins.—Professors Deneffe and Van Wetter report seven new cases in which operations have been successfully performed under the anæsthesia produced by the injection of chloral. They state that this plan has now been successfully tried in eighteen cases, and they give the details of the last seven, one of which was by Oré, of Bordeaux, the originator of the plan.

Oré's case was a young man, twenty years of age, from whom a tuberculous testicle was to be removed. The steps of the operation were substantially as follows: It was commenced at 8.43 A. M., at which time the median basilic vein was punctured and one minute later 30 grains of chloral had been injected; after two minutes the patient appeared sleepy; the pulse was 112. At 8.51 A. M., there was complete insensibility, and the operation was commenced, lasting seventeen minutes. At 8.59 A. M., there appeared to be some difficulty in breathing, from the relaxation of the tongue, which blocked up the posterior portion of the buccal cavity. By raising the hyoid bone and passing a current over the left hypogastric, this condition was overcome. The amount of chloral injected was about 100 grains, and the injection lasted seven minutes, producing complete anæsthesia, which lasted about an hour.

The patient remained in a deep sleep fourteen and a half hours, during which time his sensibility was very obtuse. The respiration was always quiet and uniform, and there was no vomiting and no period of excitement. No irritation was observed at the place where the vein was punctured.

Another case was of a woman, forty-eight years of age, who was operated on for entropion. In this case 77 grains of chloral were injected into the median basilic vein, at the rate of about 7 grains every half minute. In four minutes and twenty-five seconds complete anæsthesia of the cornea had been obtained

with about 60 grains of chloral. Complete anæsthesia lasted for forty-seven minutes, and sleep for seven hours. The results of the operation were also excellent in this case, and, on the second day following, the patient was walking in the garden. The writers observe that in all these eighteen cases no serious disturbances of respiration have been noticed, which some have claimed take place when this experiment is tried on dogs. In one case, where the patient was very athletic, 150 grains of chloral were given in thirteen and a half minutes. There was no accident in this case, though the first urine passed was found to contain albumen and blood, so that really a slight hæmaturia was produced, but this passed away and the patient did well. The writers remark that they observed less embarrassment in respiration when the solution of chloral was pretty fluid. They have generally used the solution in the strength of one to four of water, but they believe that when it was still more diluted the respiration and circulation were less affected.—*Bull. del' Acad. Roy. de Med. de Belgique.*

Eucalyptus and Tobacco.—A captain of the French army, according to "Science Pour Tous," not being able to abandon the use of tobacco for smoking, although its use caused him serious inconvenience, has for several years mixed a few dried leaves of the eucalyptus globulus with the portion of the weed which he is in the habit of using daily. Since he has employed this mixture, he asserts that he has experienced neither vertigo, headache, nor pain in the stomach. He recommends this means for preventing the disagreeable effects of the pipe, without compelling the individual to renounce his old habit.—*Medical and Surgical Reporter.*

American Medical Degrees.—These are getting more and more out of repute in Great Britain through the sale of diplomas from institutions in this country which claim the privilege of issuing them. It appears, from recent journals, that a man has been fined, in Dumfriesshire, for appending his name with the letters M. D., to a certificate of death. The man produced a diploma from the *Livingstone University* in America, and the *Edinburgh University of Chicago.* [Are there any such institutions having a legal existence?] The *Lancet* observes (Nov. 21), "it is well known that degrees in America are as plentiful as mushrooms." . . . For the prosecution it was shown that Dr. Robertson, secretary to one of the colleges in question, and who is at present in London, had offered to grant a degree from the same university as that from which the defendant held his diploma for £10, without the necessity of a course of study, and without examination.—*Med. News and Library.*

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ARTICLE I.

Address by Dr. W. W. H. Thackston.

Gentlemen of the Virginia Association of Dental Surgeons:—

Your unprecedented kindness and personal regard has devolved upon me the duty of again presiding over your deliberations, and the agreeable office of once more uttering our anniversary greetings and congratulations.

We welcome you to this hall, and to the exercises of this occasion with the confident assurance that you have improved the lessons of our last meeting; and that you have in the year just closed, made a near approach to that "*excellence*" which we then attempted to portray as the great end and object of every true professional man, and we shall confess to a sense of disappointment if the work of this present session fails to reveal an advance and improvement commensurate with our opportunities and privileges, and co-equal with the progress and development that distinguish the other divisions and departments of science.

It is useless for me to remind the Virginia Association of Dental Surgeons that the present is a period of light, and of rapid movement in all the vocations of life; a resistless energy pervades the public mind, which imparts vigor, and gives character to the varied pursuits of men; and this principle tolerates no apathy, no supineness, and no lagging or halting by the way. We feel impressed with the conviction that these truths have been recognized by this Association; and that the transactions of this annual meeting will abundantly demonstrate the fidelity with which we have cultivated the field allotted to, or chosen by us.

We anticipate with interest and pleasure the committee reports upon the many subjects embraced in, or germain to our specialty of science; and as these reports and the discussions will eliminate and develope nearly, or quite all that is new, and all that is valuable, we propose in this introductory address to say nothing of theoretical or practical dentistry, and nothing of the several departments of science essential to the correct apprehension and successful practice of our specialty. As I have intimated, these subjects will be reported upon by our committees, and discussed by the Association: they form the staple of our literature, and constitute the *curriculum* of our colleges.

In selecting a topic for your entertainment and profit, we have been led to the choice of a subject, which, though fraught with considerations of gravest import to all composing a body which seeks to deserve, and which desires and claims recognition as a "liberal profession," has been strangely neglected and overlooked by our writers and teachers, our professors and public speakers.

The obligations of dentists to society, to the profession, and to *each other*, is the theme upon which we desire at this time to submit a few observations.

In the commercial, mechanical, agricultural, and other ordinary pursuits of life, the principle of individual and personal profit and advantage is the controlling incentive and distinguishing characteristic. In the rush, and whirl, and

struggle for existence, for competence, and for wealth, the hideous principle of human selfishness is epitomized in the trite and common maxim, "every man for himself, and *devil* take the hindmost." Men, in a sense, become Ishmaelites; if the hand of each is not against his neighbor, it is only because that neighbor is too feeble to oppose his progress and thwart his plans, or too poor to pay tribute to his avarice and covetousness.

No controlling law of sympathy, no fraternal bond, and no accepted system of ethics, ties together or regulates the conduct of the busy throngs who fill the marts of trade, the shops of the artizan, or the fields of the farmer. It is true, that "trades unions," "commercial exchanges," and "farmers granges," are now seeking some amelioration, and some remedy for the ills, the inconveniences and losses incident to a system wanting in sympathy, in harmony, and in co-operation; a system that antagonizes each man with his co-laborer or fellow craftsman, and leaves him *untaught, undisciplined* and *unrestrained* by any moral code or conventional usage, to rise or fall, to reflect honor, or to bring shame upon the business of his life.

What measure of success these several organizations have accomplished, or anticipate, we are not advised; we trust that for their own benefit, and the interests of society, they may do a good work. But as a general proposition, the merchant *will* yet sell all he can,.without special regard for the rights, the claims or the interests of his fellow merchant; he does not consider it indecorous or unbusiness-like to decoy or draw away his neighbor's customers, or make the impression that *his* wares are cheaper and better, and his terms of trade more liberal and profitable to the buyer; and his fellow merchant retorts by crying, "shoddy," "humbug," and "gammon." The artizan underbids or disparages his fellow-craftsman as a "botch" and a "bungler." The manufacturer has his secret "recipes" and "formulas," his exclusive and peculiar processes and machinery, and always produces a better and cheaper article than his competitor

can supply; and the farmer, most manly and generous of them all, *will* nevertheless regard his own pigs as less mangy than his fellow-farmers, *his* horses the best, *his* cattle the fattest, and *his* implements and modes of cultivating the soil altogether superior to anything his clod-knocking, skillet-headed neighbor can exhibit or essay; and he will undersell or oversell, and seek and avail himself of any advantage that shrewdness and sharp practice may secure, uncontrolled and unrestrained by anything save his individual, and often crude apprehensions of propriety of justice and of right. Such in brief is the style and character of the ordinary business pursuits of life, as distinguished from the several professions which claim to be "learned and liberal," and for that reason assume a higher position, and claim a higher plane in social esteem.

Away back in the dim and misty past, that epoch that immediately succeeded the dark ages, and that inaugurated the revival of letters, there was a bond of sympathy, a tie of brotherhood, and an unwritten law of kindness between the astrologers and alchemists, which, if we may credit the mouldy chronicles, and musty records of early history, was of binding force and universal application. As years and centuries passed, as letters were cultivated, as science began to crystalize from the elements of knowledge, and as vocations and callings began to separate themselves, and establish their metes and bounds, and prescribe their offices and functions, *rules* and *regulations* were adopted, having for their object the advancement and elevation of each department, and for the mutual benefit and advantage of the brotherhoods representing the divisions and specialties of science, denominated professions. As time wore on, as society became more cultivated and refined, as a higher civilization and a purer morality chastened the passions and elevated the characters of men, these rules and regulations assumed the form and exhibited the quality of a well digested and carefully arranged "code of ethics;" the provisions and requirements of which have been acknowledged,

and the practical observance and operation of which have developed, dignified and ennobled the several departments of science, and in large degree constitnted the distinction between an acknowledged "liberal profession," and the several arts, trades and other pursuits of men.

As we propose to make a short and practical address, we shall for explanation and example refer to only one of the acknowledged "liberal professions," and for obvious reasons, we select the profession of medicine.

This grand old profession which embraces surgery, general and special; now hoary with years, and wisdom and virtue; ante-dating christianity, and recognized by the God man Himself as next in dignity and importance to His holy ministry, a profession cultivated, and taught, and practiced by a long line of the most illustrious men the world has seen; and now represented by the brightest intellects, the purest christians, and wisest philosophers of the nineteenth century. This profession has its "ethical code," which is taught, acknowledged, and obeyed by every medical man who respects himself and merits the recognition and respect of his fellow physicians and society. And why and wherefore? Because that code prescribes what the experience and wisdom of ages and the suggestions of benevolence, to say nothing of policy and expediency has demonstrated as best for the interests of science, best for the general good of society, and best for the individual success and usefulness of the professor and practitioner. Because it teaches the duty of physicians to their patients, their fraternal obligations to each other, and the fealty they owe to a humane and benevolent profession. Because it teaches and prescribes what is manly, and honorable, and gentlemanly; and reprobates what is mean, and low, and degrading in professional intercourse and practice, and because the spirit and letter of that "code" is to elevate the character, develop and improve the resources, and give to medicine a position and consideration second to no human calling in which men engage.

Who will say that the practitioners and professors of medicine and surgery do not stand the *peers* and recognized *equals* of the proudest and most exalted among men? And which among the learned professions lends more dignity, or confers more honor or consideration upon its members and followers? And why is it so? Not because of its antiquity, not wholly because of its enlarged benevolence and indispensable usefulness, not alone because of its great and varied learning; but because of *all* these combined with the distinguishing elevation of character, displayed by physicians in their professional intercourse with each other, and with society.

And now, gentlemen, to approach our objective point, how stands the case with *Dental Surgery*—a recognized, indispensable specialty of general medicine and surgery?

As a profession, we cannot boast the antiquity, or claim the learning that distinguishes medicine; it is only a few decades since dentistry moved out of the open domain of unlicensed art, and took its position in the line of accredited professions; some in this presence are contemporaries of its legal existence; for while dentistry was more or less successfully practiced centuries ago, it was not until the establishment of the first dental college, that the title and character of *profession* could be fairly or properly claimed.

Since the first regular and systematic course of college instruction was given, most marked and wonderful results have been realized in dental surgery; its rapid growth and development have at least kept pace with other sciences and professions; its advances, discoveries, and contributions to the sum of human knowledge, have at least demonstrated the "vigor of its youth, and the healthfulness of its organization." It has multiplied its resources, enlarged the scope of its usefulness, and greatly perfected its instruments and operations. It has in *anæsthesia*, given to humanity the great boon of the nineteenth century, and to science some of the most brilliant and startling discoveries in physiology and microscopical anatomy. It has created a special litera-

ture, and now sustains a number of well appointed and successfully conducted colleges.

From this standpoint, our progress would appear satisfactory, and our success most encouraging and gratifying; but, gentlemen, is it not true that we are lamentably deficient, and grievously derelict in understanding, appreciating, and observing the obligations accepted by all acknowledged professions? Especially, do we illustrate that fidelity to our profession, or cherish that respect and regard for the rights and the feelings of our fellow dentists, which is happily expressed in the maxim, "do unto others, as you would have them do unto you," and is it not true, that in our hurry and haste to make progress in the *material* departments of our calling, we have neglected and overlooked the moral attributes and considerations which are essential to a well rounded and symmetrical professional character?

I am happy in saying that dental surgery furnishes many examples of individual dignity and elevation of character; many conscientious and faithful observers of all the duties and obligations provided by the most rigid and exacting of ethical codes. Members we have, who instinctively, and from an innate sense of personal honor, measure up in all their acts and transactions to that standard of moral and professional excellence that seeks no improper or selfish advantage, nor stops short of the fulfillment of every moral and professional obligation. But unfortunately we are forced to acknowledge that such examples are not as general or universal as we could desire. We are a young and comparatively an undisciplined profession; a great deal of the leaven of quackery and charlatanism is yet to be neutralized or purged away; a great many of the "*tricks of trade*" still crop out and blur and blemish our professiona escutcheon.

By the "code of ethics" adopted by the Southern Dental Association, we are very fairly and thoroughly instructed as to our duties, deportment and obligations; and we most earnestly commend this "code" to your careful study and

consideration, and would unhesitatingly recommend its adoption by this Association, with such additional provisions and requirements as experience and observation have demonstrated the necessity for.

The limits of such an address as we are now making, will permit no extended or elaborate discussion of the provisions and requirements of our professional "ethical code." Some however, of its most prominent and important features and conditions we desire to bring to your attention and impress upon your minds.

As the provisions of this code relate to society, we are required to be prompt in answering the calls, and meeting the demands of our patients; to be humane and tender in our practice and ministrations; discreet and gentlemanly in our bearing and deportment, giving to our patrons the benefit of our highest skill; but in no instance should we offer the inducement of a *warrant*, or the quack-like guarantee of infallible success. And now, gentlemen, just here allow me to ask, how common, and how general is this practice of warranting our operations? How often do these warrants and guarantees disappoint the expectations of our patients? How seriously do they compromise the character of our profession, and how often do they return to plague and damage their authors? The usage is discountenanced by the medical profession as wrong and impolitic in practice, and should be ignored and abandoned by all respectable dentists. If our attainments as scholars, and our skill as operators, if our reputations as gentlemen fail to inspire public confidence, rely upon it, that we are resorting to a most questionable and humiliating expedient, when we offer for patronage the inducement of a warrant.

But to resume, we are to respect the confidence reposed in us by our patients, and under no circumstances, expose the physical defects and misfortunes it is our office to repair and restore. It would be unprofessional and ruffianly, for a dentist to proclaim the edentulous mouth of his lady patient, or to exhibit as a trophy of his skill, the artificial

substitutes he had been employed to construct; and so in like manner, it would be a violation of the spirit, as well as the letter of the "code," to expose any condition or circumstance that would pain the feelings, or shock the delicacy of our patients.

The wives, and daughters, and sisters of our patrons, are entrusted to our care and protection while the subjects of our operations and treatment; and that confidence should be acknowledged by the most exact and scrupulous regard, and the observance of all the proprieties of refined and cultivated society. In no pursuit or profession of life, is demanded a higher or more rigid illustration of all the qualities that distinguish a virtuous, refined and elevated gentleman, than in the relations and intercourse of the dental surgeon. Our personal habits, the appointments of our offices, and our conversation and general deportment should be such, that the most fastidious, the most timid and delicate of our patients may never hesitate, or fear to place themselves under our personal or professional care. While we should display the requisite firmness for the faithful performance of all our offices and operations, no roughness, no rudeness and barbarisms are permitted or tolerated by our code.

The dentist who enhances the unavoidable discomforts of his operations, or awakens the disgust of his patients by coarseness or vulgarity, not only irreparably damages himself, but inflicts contempt and reproach upon his profession.

For the specialty of medicine and surgery that we have chosen as the business of our lives, we should cherish admiration and affection; we should not regard it as simply a means of livelihood, a path to competence or fortune, but we should love it as one of the benign institutions of advanced civilization; we should love it for the benefits it dispenses to suffering humanity, and for the material and substantial rewards it bestows upon its faithful students and practitioners, and thus loving it, we should cheerfully and indefatigably labor for its advancement. Those who have

gone before us, who have laid the foundations and built the superstructure upon which we now stand, have placed us under obligations we may never fully discharge. We enjoy the advantage of all the learning, the inventions, discoveries and improvements that have been wrought out and accumulated by our predecessors, and it is but a just and reasonable requirement that we should labor for the common good and general benefit of a profession to which we are so largely indebted.

We can therefore consistently have and hold no secret methods or forms of treatment, no instruments or operations, which can be withheld from the profession; we can appropriate to our personal and *exclusive* use and advantage, no invention, discovery or advance in science. It is true, that by a sort of common consent, or tacit acquiescence, the *patenting* of strictly mechanical implements and appliances, has been sanctioned, and such articles have been adopted and employed by the regular professions; but beyond this point, no individual appropriation of a professional improvement or discovery can be permitted. Humanity, to say nothing of the claims of science, has interests which cannot be overlooked or disregarded. Imagine for a moment, the effect and result of a patent upon, and an individual appropriation of *vaccination*, of *quinine*, of *chloroform*, of *morphia* and *mercury;* a monopoly of these and a thousand other indispensable remedies held by some merciless shylock, or soulless corporation? Think for a moment of the outrages and extortions, the frauds and corruptions of the "rubber patent;" frauds and exactions which have harried and worried the dentists of the country beyond endurance, and corruptions that have reached even the temple, and soiled the pure ermine of justice.

The protection of society, no less than the interests and reputation of science, demand that this *secret* and *patent system* be confined within the narrowest possible limits, in all recognized "liberal professions."

The professional man who makes a valuable discovery, or invents a useful instrument, and cheerfully dedicates it to

public use and enjoyment, has his reward, and finds his recompense in the consciousness of a generous action, nobly performed, in the distinguishing esteem and consideration of his brotherhood, of society, and of posterity.

Who would to-day exchange the honor and immortality of Harvey, or of Jenner, and in our own profession, of Barnum, and a thousand other unselfish and elevated discoverers and inventors, for all the gold, and all the shame that has been gathered by Bacon and his company, from all their fraudulent patents and corrupt and collusive suits at law? So much, gentlemen, for secret remedies, secret methods of operating, and professional patents. We will now ask your consideration of another feature of the "code."

In communicating with the public, in announcing our purpose to practice, a change of office or residence, a modest card of a few lines, *is the correct thing.* The publication of long advertisements, the posting of great show bills, supplemented by a long list of certificates and testimonials from clergymen and other public and private citizens, setting forth wonderful and peculiar instruments and operations, extraordinary skill and great cheapness of terms, are practices utterly derogatory of professional character; and are reprobated and discountenanced by every principle of good taste, and every sentiment of personal dignity and professional honor. Such things are the devices of quacks and charlatans, of showmen and sharpers. No man of science so demeans himself while in the pale of professional recognition, or so demeaning himself, fails to forfeit the respect and esteem of his fellows, and the good opinion of refined and cultivated society. In our conduct and bearing before the public especially, we should exhibit respect and consideration for each other. We know the tendency and too common effect of sharp competition and ungenerous rivalry in practice; we know the temptation to disparage, or "damn with faint praise," the competitor who may appear to stand in our way, or obstruct our progress; but no sadder or more fatal mistake, no blunder more criminal can

be committed, than for a professional man to habitually belittle, dispraise, or calumninate his fellow-dentist, or fellow-physician. Such conduct most usually defeats its object, and is sooner or later sure to bring upon its author the ret ribution of a lowered esteem, and impaired confidence in his own capacity and integrity.

We should be exceeding cautious how we criticise the modes of practice, and the operations of other dentists, particularly when we are consulted by those who have been their patients. We should discourage, and be slow to give countenance or credit to the complaints, the gossip, and censures so commonly indulged by parties who often from unworthy motives, seek a change of professional service, and desire to justify their conduct by defaming the dentist or physician who has faithfully, and to the best of their ability, answered all their calls and met their demands. We should not only feel it a duty, but find pleasure in *commending* the attainments, and *complimenting* the work of our fellow-dentists whenever we can conscientiously do so.

If our brother should fail, as all, even the most distinguished and skilfull *must* sometimes fail, we should explain and excuse his misfortune. Unfailing and unvarying success is the boon of no mortal man, and none, save the unprincipled charlatan, ever asserts such a pretension.

In our intercourse with each other, we should be kind, cordial and fraternal; we should ever hold ourselves ready to sustain a brother in the right, and to aid him by counsel, assistance and advice. We should open our offices, our laboratories and libraries, and freely and frankly interchange sentiments, opinions and convictions upon all professional subjects. The aged and experienced, should by kindly offices and prudent counsels, sustain and encourage the younger members of the profession; and the juniors should cherish and display a becoming deference and respect for those, whose long years of service and devotion have given to dental surgery its present consideration and importance. When necessary, or when requested to do so, we should

cheerfully assist each other by consultation, or by taking part and assuming responsibility in any difficult or delicate operation. We should render each other, and the families of dentists while under the paternal roof, all necessary professional service, without the usual or specific fee. Where the use of any considerable amount of valuable material is demanded, no dentist who has the least respect for himself, will permit you to furnish it without compensation; and should your brother operator tender you an honorarium, or token of his appreciation of your skill and service, you may with consistency and propriety accept his offering; *but in no instance* are you to regard physicians who reciprocate professional services, or dentists and their families, the subjects of regular professional fees. And this, gentlemen, brings us to the last proposition we shall discuss in this address; to that prolific and unfailing source of discord and disagreement, of strife and estrangement in all professions, but perhaps more than any other, in our own: the subject of "fee tariffs."

We have sometimes thought it a great misfortune to humanity, and a great draw-back and impediment to the several professions, that there could be no *legalized minimum* scale of fees to which all practitioners should be rigidly held; that is, that it should be penal or punishable for any practitioner to underbid the prescribed rates of charge. Such a statute would certainly lop off, and prune away many excrescences, and much of the *fungi* that now blemish the character and impair the vitality of all professions. It would cure a great deal of pettifogging in law, a great deal of fanaticism, imposture and heresy in theology, and a great deal of quackery and humbug in medicine and surgery. But as we can have no statute law regulating professional fees, our next and only apparent remedy, is in conventional or professional law and usage. Now, gentlemen, we are no admirer or advocate of *mere fancy operations* in our specialty; we are no apologist of extravagant or exorbitant fees for our service; but as you, and the whole

profession know, we have always urged the highest attainments, and the faithful exercise of the greatest skill for the benefit of our patients and patrons; we have endeavored to teach and to stimulate your efforts by the conviction, that *excellence* and *superiority in practice* is the great demand of science, and of enlightened society.

While our profession is a charitable and beneficent one, we cannot as a general rule practice "*con amore*," or gratuitously; we must have that profit and compensation that will meet and provide the wants and needs of life; and it is unnecessary for me to tell *you*, that *low* and *cheap* fees, as popularly understood, are not compatible or consistent with good and faithful work. You know that a *low* "*fee tariff*" can only be maintained by hasty and imperfect work, and by the employment of most inferior implements and materials, and that the inevitable effect of such practice, is to arrest all progress, to degrade and debauch our profession, to impair our self-respect, and to diminish or forfeit the confidence and esteem of society.

We know of no one thing, we can imagine no single act of a professional man, that will so promptly and certainly bring upon him the distrust and contempt of society, as his cheapening the money value of his operations as a bid for patronage. The universal and very sensible conclusion is, "if the *pay is poor*, the *practice must be equally poor*."

A just regard for all the proprieties, equities and provisions of the ethical code, demand that an acknowledged and accredited dentist should adopt a "fee tariff" that will afford him fair and liberal compensation for the best and most faithful service he can render. When practicing in a town or city, or when elsewhere in competition with regular and respectable practitioners, he can with propriety do nothing less than accept the usual or established fees of the locality. But it is optional, and not in contravention of the spirit or letter of the code, for a physician or surgeon to adopt a *higher* "*fee tariff*" than had previously obtained in his field of practice. If his greater learning and superior

skill can sustain such advance; should an appreciative community acknowledge his claims to enhanced compensation, he is *fairly* and *justly* entitled to the advantage. The demand and acceptance of higher fees can work no damage to his fellow-practitioner, or to the profession; but great good to both by the *stimulus* that generous compensation always gives to progress and improvement. But *cheapening*, undercharging, or more properly expressed, *underbidding*, to secure patronage and practice, is prohibited by every consideration of policy and propriety, and by every sentiment of professional honor and decency.

The comments and observations we have submitted upon the subject of fees and charges, have of course no application to what is known as eleemosynary, or charity practice; such demands all professions recognize, and accept for reward, the consciousness of a sacred duty cheerfully performed.

Such, gentlemen, is the spirit, and such some of the requirements and prominent features of that ethical code which will give dignity and character to your chosen pursuit, and which in all the professional relations of life, should distinguish you from the artizan and trader.

As you accept the provisions of this code, as you are imbued with its spirit, and illustrate its principles, so will you promote the best interests of society, and establish your individual claims to recognition as members and ornaments of a liberal and elevated profession.

ARTICLE II.

Virginia Dental Association.

First Day.

This Association convened December 15th, 1874, in its fifth annual session at Association Hall, Dr. W. W. H. Thackston, of Farmville, president; Dr. George F. Keesee, secretary.

On calling the roll, it was ascertained that nearly all of the city dentists were present, with a fair representation from other parts of the State.

The Committee on Membership reported favorably on the following names, and they were unanimously elected: Drs. W. L. Cowardin, W. L. Burton, C. A. Mercer, Richmond; George H. Cooke, Louisa, and Thomas L. Sydnor, Salem.

Dr. R. N. Hudson, having retired from the practice of dentistry, was elected an honorary member.

An invitation was extended by Drs. John G. and George G. Wayt, to the members to witness an electric engine, and the application of steam to the Morrison engine, at their office, which was gratefully accepted.

The report on dental histology and microscopy, was read by Dr. Wood, accompanied by diagrams, and was an interesting and instructive document, and from which the writer deduced the following: That the dental pulp is composed of fibrillæ more or less branching. The organ extends to, surrounds, and closely invests the pulp. Hard dentine is calcified dentine. The portion remaining uncalcified we call dental fibrillæ. There is no inter-fibrillæ substance whatever. Fresh dentine, therefore, has no tubuli, but has uncalcified fibrillæ. That the difference between dentine and the fibrillæ is simply one of mineral element. Enamel and dentine are not vitalized tissues as far as the calcified portions are concerned. Enamel proper and dentine proper are amenable to physical and chemical laws only, and therefore any sensitiveness in dentine is in virtue of its fibrillæ and of their organic continuity with the terminal nerve-fibres in the pulp.

Dr. Thackston agreed in the main with the writer, but stated that he had not accounted for the extreme sensitiveness often found on the line between the enamel and dentine, he believing that the connecting medium must be a vascular one, Dr. Wood's theory being that the sensitiveness arose from the terminal ramifications of the fibrillæ.

Dr. Thompson thought the report covered the entire ac-

cepted theory of the present day, and was sustained by microscopical researches.

Dr. Thackston, in proof of the views expressed by him, stated that if the source of supply and nutrition which existed between the dentine and pulp was severed, that the dentine would eventually darken and become a dead substance.

The president delivered his annual address, extending to all the members of the dental profession a hearty welcome, and announced as his theme, " The obligations of dentists to society, to the profession, and to each other." The progress of the profession was satisfactory, and our success most encouraging and gratifying. Dental surgery furnishes many examples of individual dignity and elevation of character, many conscientious and faithful observers of all the duties and obligations provided by the most rigid and exacting of ethical codes. Members we have who instinctively and from an innate sense of personal honor measure up in all their acts and transactions to that standard of moral and professional excellence that seeks no improper or selfish advantage, nor stops short of the fulfillment of every moral and professional obligation. We are required to be prompt in answering the calls and meeting the demands of our patients, to be tender and humane in our practice and ministrations, discreet and gentlemanly in our deportment, giving to our patrons the benefit of our highest skill. In no pursuit or profession of life is demanded a higher or more rigid illustration of all the qualities that distinguish a virtuous, refined and elevated gentleman, than in the relations and intercourse of the dental surgeon with his patrons and patients.

Our limited space forbids a more extended notice of the doctor's elegant and chastely written address, filled, as it was, with high and lofty sentiments and enforcing with high and commendable zeal the maxim, " Do unto others as you would have them do unto you."

AFTERNOON SESSION.

Dr. Henkel read a very carefully prepared and interesting report on dental physiology. This subject had been in the past looked upon as of but little importance. So great has been the desire for active mechanical operating, that it is feared that many have by neglect of all physiological signs, so often met with in every-day practice, placed themselves altogether on a mechanical platform, and only able to look at their patients mechanically, closing their eyes to the physio-pathological fruit before them tempting them to pluck and digest mentally, thereby awaking out of the physiological sleep into which they have fallen. The report urged that a more rigid study of physiology be required of the dental student.

The report (of which we have only been able to give the concluding sentences) was discussed by Drs. Thackston, Wood, Moore, and others.

Dr. Thompson next read an admirable report on dental chemistry. That part of it which elicited the most discussion, was a reference to two important chemical agents, which, though of themselves old, were yet in their application new and highly useful in operative dentistry—namely: wood creosote and acetate of lead.

Dr. Wood advised a trial of the acetate of lead as recommended in the report.

Dr. Jeter believed that ood crweosote was a very different article from the creosote ordinarily used.

Dr. Thackston stated that creosote of commerce was only common carbolic acid.

Dr. Thompson advised the use of alcohol as an antidote for the escharotic effect of creosote.

Dr. Wood thought simple oil would answer the purpose.

Dr. Keach gave in detail an account of the application to the nerve of the sponge saturated in acetate of lead.

Dr. Wayt considered it well worthy the trial, and won-

dered that it had not occurred to him before, as in the early days of his practice he had used lead pivots, and always with success.

It is impossible, in the limits of a newspaper article, to do anything like justice to the very able, interesting, and instructive reports and discussions of this Association.

The Association adjourned to meet at 10 o'clock to-day.

SECOND DAY.—Wednesday.

The meeting was called to order by the president at 10 o'clock, and the minutes of the preceding day read and approved.

The report on dental chemistry, the discussion of which was pending when the Association closed its previous session, was first taken up.

Dr. Burton recommended the application of carbolic acid simply to the nerve before capping with the oxychloride.

Dr. Mahoney had found no cause to regret his former practice of filling immediately the exposed nerve with the oxychloride, and expressed surprise at the statement made by some that such treatment had proved a failure.

Dr. Henkel had found that carbolic acid, applied in the manner described, was escharotic in its effects, and so the nerve was in a measure destroyed, and was afterwards likely to give trouble.

Dr. Hunt, of Washington, expressed gratification that the profession were giving more attention to chemistry than formerly. We should not only use chemical agents, but should know their properties, and how and and why they produce certain results. All art is based on science, and effects are the result of causes, and all subject to laws. We formerly destroyed nerves, now we seek to keep them alive, and these chemical agents are brought into requisition. We know not always why certain results follow, but we are progressing, and should not be satisfied until we can say we know; and in order to attain this end we should pursue diligently the study of this most important branch of our profession.

The report of dental pathology and surgery was next called for, but in the absence of the Committee the subject was passed, Dr. Henkel stating that the chairman, Dr. Johnson, had prepared a very elaborate report, but objected to sending it as he could not be present.

The subject of dental therapeutics was also passed, on account of the absence of the chairman of the committee. The president said, not in any spirit of censure, but as a suggestion, that it would be well for each member of a committee to prepare a report, and not rely on the chairman, and hoped this would be done in future.

Dr. Jeter, on behalf of the Executive Committee, tendered the use of the offices of city members of the Association for clinical exhibitions.

In reply to the query, What are the duties of the Executive Committee? the secretary read a portion of the constitution relating to that subject.

Dr. Steel suggested that they should also be made a committee on hospitalities, or that a special committee should at the proper time be appointed. It was desirable that there should be at all these meetings a full attendance. Especially should inducements be offered to those at a distance.

A communication was received from Dr. N. M. Burkholder, of Harrisonburg, Va.

On motion of Dr. Steel, the paper was referred to the president, with the request that if approved by him, it should be read under the head of Voluntary Essays.

Dr. Steel, chairman of the committee on mechanical dentistry, made a report on that subject. He reviewed in brief the qualities of the several bases used for mounting artificial teeth, was still of the opinion that there is not, never has been, nor ever will be, anything *superior* to gold for this object, but that the demand for something cheap was so great that the profession had been obliged to look around them for some material less expensive than gold or platina. Rubber had been and still was extensively used, but was

objectionable on many accounts. Celluloid was now occupying the attention of the profession, and promised better results. He had been successful in its use, especially under the new method of preparing it by dry heat, and was glad to state that Dr. Hunt, the inventor of the dry heat process of preparing celluloid, was present, and no doubt prepared to give information on this subject.

Dr. Moore was pleased with the celluloid, and believed it would eventually supercede rubber.

Dr. Henkel, of Staunton, said that though he lived near where they kept crazy people, yet, as he was now among sane ones, he wanted to talk a little. He had used celluloid first with olive oil, then with tallow, but had not tried the dry heat referred to in the report; but from that and the subsequent discussion believed it to be the best cheap base now in use, though he had found difficulty in shaping it. Had also known it to assume a leathery consistency.

Dr. Hunt, the inventor of manipulating celluloid by the dry heat process, stated that celluloid could be *coaxed* to any desired shape, but could not be unduly forced. This forcing process doubtless caused the leathery consistency alluded to by Dr. Henkel. Celluloid is a new article; is made of cotton converted into gun cotton; then by the use of camphor into what is called pyroxyline. Hemp was in some cases substituted for cotton. Dr. Steel was correct in saying that *gold* was the best, and in recommending celluloid. It was best as compared with rubber, and it had some qualities superior to gold in that gold and silver felt hard in the mouth. In the natural teeth the periosteum counteracted the pain that would otherwise be occasioned by the occlusion of the teeth, so the springing, yielding properties of the celluloid served somewhat the purposes of nature in this respect. Celluloid is new; it is not yet four years since it was first introduced. He did not claim for it perfection, nor that it would supercede gold directly, but as rubber has to a large extent pushed gold out of the way, so he believed celluloid was destined to take the place of rubber, as the

demand was for some cheap base. We know that rubber has been used under protest, particularly on account of its tendency to cause inflammation of the parts of the mouth with which it comes in contact. More can be done with celluloid, while its use is not injurious to the mouth. It approaches nearer in its nature and character the demands of the tissues. Celluloze, from which celluloid is made, is composed of carbon, hydrogen and oxygen. He thought the only objectionable feature about celluloid was its coloring matter, though that was slight as compared with rubber, for while rubber has 30 per cent. of vermillion, celluloid has only about one or one and a half per cent. Water, oil, steam, glycerine, and the dry heat had been successively used in manipulating the plate. He stated the advantages and disadvantages of each, and was satisfied that the new process of dry heat was the best. The camphor is a latent solvent, is volatile, and is evaporated by the heat leaving the celluloid seasoned. He exhibited a partial set warped by reason of not being seasoned, or by an unequal evaporation of the solvents. Described at length how these defects might be remedied. Was now directing his attention to the more thorough preparation of plaster of paris for making the moulds on which to shape the celluloid plates. (Dr. Mahoney inquired if all the camphor was evaporated would not the remaining mass disintegrate?) Dr. Hunt, resuming, said it was best not to drive out all of the camphor. After moulding the plate drive out as much of the camphor as is necessary. This can best be done by dry heat. This should not be done at too high a temperature, and as proof of it exhibited a spoilt piece caused by heating to too great an extent. A thermometer could not be used, but must be regulated by the judgment of the manipulator, or as had been expressed, by "rule of gumption"—common sense.

The hour of adjournment having arrived, on motion, Dr. Hunt was invited to give an exhibition of his process during the afternoon session.

AFTERNOON SESSION.

The Association met promptly at 4 P. M.

Dr. L. M. Simms, of Chesterfield, and Dr. W. T. Downer, of King William, were elected to active membership.

Dr. Hunt now proceeded to exhibit his dry heat process of working the celluloid, and making such verbal explanations as were demanded of him. The members all seemed interested, and were doubtless instructed, as a unanimous vote of thanks was tendered him by the Society.

Dr. Steel exhibited a remarkable specimen of osseous union of the fangs of second superior molar and wisdom teeth which he had removed for a patient; also, some deciduous teeth which were filled seven or eight years ago, and remained perfect until they were shed, thus demonstrating the advantage of filling children's teeth, of which he is a great advocate, believing as he does that nature never designed that these teeth should be lost until the new ones were ready to take the place of them.

The Association then adjourned to meet at 10 o'clock Thursday, when the subject of mechanical dentistry will be resumed.

(TO BE CONTINUED.)

ARTICLE III.

Georgia State Dental Society.

The sixth annual meeting of this Society convened in Atlanta, the 11th, and adjourned the 14th of May. Dr. A. C. Ford, of Atlanta, President, in the chair.

Sixteen new members were added to the rolls. The following papers were read:

Dental Histology and Physiology, by Dr. George Peterson, of Waynesboro. Dental Surgery, by Dr. E. Parsons, of Savannah. Mechanical Dentistry, by Dr. J. L. Fogg, of

Barnesville. Dr. James A. Hart, of Hawkinsville, read a description of a case of surgery in his practice, and exhibited some rare specimens of abnormal growth of teeth.

The Executive Committee chosen by the Society, and the law passed by the State Legislature, to regulate the practice of dentistry in the State, reported a form and method of granting license which the Society approved.

Resolutions upon the deaths of Drs. Fogle, of Columbus, (one of the oldest members in the State,) and Campbell, of Atlanta, were read, and spread upon the minutes.

Officers elected for the ensuing year:—

President.—Dr. George Peterson, of Waynesboro.

1st. Vice-President.—Dr. G. W. McIlhaney, of West Point.

2nd Vice-President.—Dr. J. P. Holmes, of Macon.

Corresponding Secretary.—Dr. M. S. Jobson, of Perry.

Recording Secretary.—Dr. L. D. Carpenter, of Atlanta.

Executive Committee.—Dr. E. Parsons, of Savannah; E. M. Allen of Marietta; J. P. H. Brown, of Augusta; W J. Tigner, of Columbus; and H. A. Lowrance, of Athens.

Committees to report at next meeting:—

Histology and Physiology.—Drs. Chas. C. Allen, of Marietta, and D. S. Wright, of Macon.

Pathology and Surgery.—Drs. J. P. H. Brown, of Augusta, and M. H. Thomas, of Monroe.

Chemistry and Therapeutics.—Dr. L. S. Ledbetter, of Cedartown, and D. Parsons, of Savannah.

Operative Dentistry.—Drs. A. C. Ford, of Atlanta; and M. S. Jobson, of Perry.

Mechanical Dentistry.—Drs. S. J. Holland, of Atlanta, and R. J. Hampton, of Rome.

Dental Education and Literature.—Drs. F. Y. Clarke, of Savannah, and J. H. Coyle, of Thomasville.

Clinical Operators.—Drs. L. D. Carpenter, of Atlanta; R. W. Thornton, of Calhoun; J. W. Murrell, of Athens, and J. P. Holmes, of Macon.

Dr. G. F. S. Wright, of South Carolina, by request exhibited the Electrical Burring Engine and Mallet.

Clinics were held by Drs. Wright, of South Carolina; Pool, of Columbus, and Ford, of Atlanta.

The next annual meeting will be held in Atlanta, (as provided by the Constitution,) on the second Monday in May next, (10th,) at 10 o'clock A. M. All dentists in the State particularly invited to be present, and all from other States who are in good standing, cordially invited to attend.

ARTICLE IV.

Case of Resuscitation from Apparent Death from Chloroform.

AS RELATED BY DR. A. EUBANK, OF ALABAMA.

A young lady, between fifteen and twenty years of age, came to his office accompanied by her physician, for the purpose of having a tooth removed. Having expressed a desire that the physician should administer chloroform, he did so, and the tooth was extracted without difficulty. About five minutes afterward, and when consciousness had returned, respiration suddenly ceased, and though the chair was thrown back to bring the body in a more horizontal position, and the dress was loosened, yet no sign of returning life was manifest. In this emergency two other physicians were sent for, while Nelaton's method of inverting the body was resorted to. The effect was prompt and satisfactory, respiration at once being resumed, and continued during the time the patient was kept in that position; but immediately upon the resumption of the horizontal condition, respiration at once ceased again. The inversion was repeated with the same satisfactory results, respiration commencing promptly and continuing for some ten minutes, when on the body being again placed in a recumbent posture, breathing again ceased. In the interim, on the advice of the medical men present, Granville's lotion was applied to the spine, and the feet immersed in hot water, but with no apparent good re-

sults. For the third time the inversion was resorted to, and the patient kept in it for some ten minutes or more, when respiration seeming to be fully established, the body was placed in a recumbent position once more, and no return of the grave symptoms was seen.

During all this time there was spasmodic closure of the jaws, and preventing access to the tongue had it been in the way.

The case is one of interest, as proving in a conclusive manner the efficacy of this method of resuscitation from apparent death by chloroform, and has suggestive value.

SELECTED ARTICLES.

ARTICLE V.

Comments on the Recent Address of Dr. Allport before the Academy of Dental Science, Boston, Mass.

BY J. RICHARDSON, TERRE HAUTE, IND.

We have been interested in the perusal of the above address, partly because it is from the pen of a well known and accomplished practitioner whose views generally command attention, but chiefly because it affords a convenient text for the consideration of a question which has not been heretofore extensively discussed, namely, the status of our profession in its relation to medical science.

The attentive reader of this address will not fail to notice that the scheme of separating mechanical from medical,

surgical, and operative practice, has its birth in an overweening ambition to ultimately secure from the medical faculty a full and unqualified recognition of our calling as a medical specialty. All this talk about the divorcement of these departments of dental practice is intended but as a means to this end,—a tub thrown to the whale,—a sort of propitiatory or sacrificial offering up of the professional rabble to secure a prospective and everlasting inheritance of glory for the elect few. Indeed, we are left in no doubt about this ulterior purpose. The doctor explicitly says:

"With the development of this higher mission of our profession there will be no occasion for the spectàcle of dentology, with the grimace and shuffle of the mendicant, approaching the gates of the medical profession, and with downcast eyes begging a crumb of recognition. But with the accomplished separation of the two callings, heretofore combined in our practice, dentology, enriched by the experience of the special literature of the last half century, and the foundation of its practice laid exclusively in the science of medicine, rather than divded between that and a trade, the incongruity of the past will, in a few years disappear, and by deriving its nourishment from the body of which it is a branch, it will become more, and still more assimilated to the science and practice of medicine, and without demand, there will, both by the public and the medical faculty, be accorded, not to individual practitioners, but to the branch a full and cordial recognition as a specialty in medicine."

Thus, in imitation of the professional beggar, who, failing by other means to excite compassion and alms-giving, resorts to self-mutilation, the author of the address before us coolly proposes that the dental profession, which, by implication, he charges with presenting the spectacle of a mendicant at the door of the medical profession beseeching in vain for a crumb of recognition, shall now, as a forlorn hope, be thrust forward in all its self-imposed rags and shameless pretense of poverty in the superadded role of cripple. The

doctor fairly chuckles over the shrewdness of his device, and rubs his hands together with unctious satisfaction in contemplation of the mollifying effect this unsightly deformity will have when added to the "grimace and shuffle" of his pet mendicant.

But, unfortunately for the author's designs, the plain fact is that he totally misapprehends the grounds on which the medical profession withholds recognition of our calling as a medical specialty. It makes no such demand as that implied by Dr. Allport. If this project of dismemberment were an accomplished fact to-day, he would not be so much as the breadth of a hair nearer the realization of his ambitious dream. Could he lop off at pleasure every branch of special practice having the slightest taint of mechanism about it,—the construction of artificial sets of teeth, obturators, appliances for dental irregularities, contrivances for fractures, the operation of filling teeth, the improvising of needed instruments and appliances for special or anomalous purposes, and so on, until the atmosphere of his office should become so purified that his professional olfactories should be no longer offended by the vile odors from the shop, but delight rather in the subtle and delicate aroma arising like grateful incense from pure and undefiled medical science, yet would he, despite all this trimming, and all his vaulting aspirations for higher medical culture, be still found waiting with "downcast eyes" in the attitude of a suppliant at the threshold of the medical profession with the same chances as now of being unceremoniously booted from the premises.

Dentistry, construed according to the standard of requirements prescribed by the medical profession from time immemorial in respect to other departments of the healing art, can be regarded as, in any proper sense, a medical specialty. Nor, we venture to affirm, will it ever be so accepted without a virtual abandonment of its distinctive organization as a professional body. The restless and unsatisfied spirits who are continually possessed with the mania for recognition will do well to accept the decision of the

medical profession on this point as authoritatively enunciated lately by the editor of the Philadelphia *Medical Times* when he declares that, "If dentistry in the abstract is worthy of the position as a medical specialty, the living concrete dentistry can only gain such honor by a complete reorganization of the profession." Commenting upon the aids which the profession has derived from dental colleges, he remarks: "They (dental colleges) are an insuperable bar to its, (the profession) ever becoming a medical specialty, and the degree of D. D. S. is a badge of partial culture which must shut out from the medical ranks every one who wears no other insignia. * * * * So long as the dental profession by their deeds say, that such half culture is all that is necessary for a dentist, why should the members complain if the world and the *Times* agree with them and assign to dentistry the position which it at present holds." And again: "There is only one way by which a higher position can be achieved, and the first step is the abolition of the dental colleges and an enforcement of the idea that a general medical education must precede the special one."

Reorganization then is the condition precedent of recognition, and not the puerile deodorizing expedient dished up for us by Dr. Allport. If, in order to pass the sacred portals of the Aesculapian temple, we must needs suffer amputation of some objectionable part of the body professional, it is imperatively demanded that we shall offer the head rather than the extremities to the medical guillotine.

When we come to reflect how little identity there is between the dental profession and the recognized medical specialties, we shall feel less chagrined at the declaration of the *Times* editor that "the claim that dentistry is a branch or specialty of medicine is generally met by internal cachinations, whatever external behavior the laws of politeness enforce."

In what respects then does dentistry differ from the avowed medical specialties?

1. A medical specialty proper, being the study and practice of a special department of general medicine, always pre-supposes an antecedent acquaintance with all the various branches of medical science. It is indeed but a creature, a product so to speak, of medical science, unrecognizable by any other relationship. This requirement of a general medical education therefore implies *whole* medical culture.

Now it is not claimed that any such general medical education is necessary in the case of the dental profession. The course of medical studies embraced in the curriculum of our dental colleges, and which may be taken as an expression of the highest medical attainment in our calling, does not by any means include every branch of the medical sciences, and therefore implies only *partial* medical culture.

In this view of the case, the lack of identity between dentistry and the medical specialties proper is apparent. It may be farther confined by an interpretation of the medical and dental degree. M. D. is the specialist's badge of medical culture, and signifying Doctor in Medicine, implies wholeness, or completeness. D. D. S. is the dentist's badge of medical culture, and signifying Doctor in Dental Surgery, which is but a *department* of medicine, plainly implies only something partial or fragmentary.

2. We style ourselves a *profession*. It is quite the fashion amongst us to boast of this, and there are none so tenacious of this characterization as those who clamor for recognition as a medical *specialty*. Now a profession, as designating any particular calling or avocation in life, implies unity, oneness, wholeness, completeness. Thus, amongst others, we have the medical and legal professions. Each of these has a distinctive educational system suitable to its organic structure, and commensurate with the requirements of all the multiform details of its peculiar work. However, many special departments may grow up within the body of these organizations to meet the exigencies of practice, still the idea of unity or wholeness must always attach to them in aggregated character of a profession. Dentistry is prop.

erly enough classified as a profession, having within itself all the necessary educational machinery to render the study and practice of all its departments complete. In the completeness and unity of its organic structure it is identical with the other professions mentioned. Here then is another point of departure in which identity is completely lost. By what process of legerdemain or hocus-pocus can it be a profession and a specialty at one and the same time? It would be very like a father claiming to be his own son, or a son his own father. If dentistry is properly a profession, it cannot also be a specialty, for one implies a whole and the other a part, and these plainly are not co-equal or identical except on the illogical assumption that the whole is equal to a part, or a part equal to the whole. If dentistry is a profession it can not be a specialty, for the whole can not be equal to a part, and if it is a specialty it can not be a profession, for a part can not be equal to the whole.

Surgery and opthalmology are specialties in medicine, but who ever heard of the surgical and opthalmological professions? In the legal profession the study and practice of commercial law is recognized as a legal specialty, but has it ever entered into the head of any one to designate this special practice as a profession? Operative and mechanical practice are regarded as specialties in dentistry, but no one has ever characterized them as professions.

Viewing the subject in this light, it seems incredible that any one of average intelligence should indulge the expectation that dentistry can ever become recognized as a specialty in medicine and yet retain its distinctive character of a profession. The proposition is not only absurd but presumptuous. If any one of the now recognized medical specialties were to take on such airs, it would be summarily ejected from the medical profession.

3. But perhaps the most conclusive reason why dentistry can not be recognized as belonging to the family of medical specialties, is because there is no blood relationship. Recognition is the birth-right of the avowed medical special-

ties, for they are legitimate offspring begotten within the body of the medical profession, and unchallenged heirs to all the rights, dignities, and immunities conferred by the doctorate in medicine. But dentistry is a body wholly alien to the medical profession by reason of its extraneous origin. It was born, so to speak, outside of wedlock, and is therefore barred from all rights of inheritance. It never had any acknowledged parentage, and is not even positively known to have been born at all, but, like Topsy, it probably "just grow'd." It is probably therefore "nobody's child." But it has thrived wonderfully nevertheless through all the period of its growth and development, counting from the time when it was, in some mysterious manner "ushered into this breathing world but half made up, and that so lame and unfashionable that the very dogs barked at it" to the present, when it may fairly challenge the admiration of mankind for its marvelous comeliness of form and feature. And this is the symmetrically-built, well-favoured, self-assuming, "child of fortune" whose fair proportions our distinguished friend proposes to mar for a consideration somewhat less substantial than a "mess of pottage."

But our medical friends will not compound on such terms. They are inexorable in their demand that we *shall be born again*, which means that, as a distinctive profession, we shall first suffer disorganization and death, and then become reorganized and legitimatized within the body of the medical profession by the usual processes of conception, uterogestation and accouchment.

To this complexion must it come at last, if we are to be counted in as a medical specialty. Who in our profession are willing to abandon our present organization for the doubtful honor of being tacked on as a fragmentary part of the medical profession and dubbed medical specialists. If there are any such, let them speak and they shall have a respectful hearing. But until we are prepared for such a step let us be spared all this twaddle about the recognition our calling as a medical specialty.

It was no part of our original purpose to discuss in this article the scheme of separating the mechanical from the other departments of dental practice proposed by Dr. Allport. It certainly is sufficiently vulnerable to invite criticism, and we may address ourself to that particular feature of his address at another time.—*Dental Register.*

ARTICLE VI.

Precautions During Anæsthesia.

The following extracts are from a note appended to a letter addressed to the *British Medical Journal*, by Dr. Bigelow, of Boston:

Under these circumstances, a few practical suggestions, in a familiar form, however superfluous or even trite to a part of the surgical world, may perhaps not inappropriately serve as a record of the current views and practice of etherization in the hospital with which I am connected—which has, perhaps, a larger experience than any other of this form of anæsthesia.

1. Accept the odor and bulk of ether as a cheap compromise for the safety of the patient and the confidence it gives the operator.

2. Believe that the anæsthetic effects, whether pleasant or objectionable, do not differ materially from those of chloroform.

3. Recognize the fact that, while chloroform may kil without warning, ether never does.

4. Aim at anæsthesia by inebriation, not by asphyxia With ether vapor, insure air to the patient. Though he struggle at the beginning, if he is not rigid, or too livid, it is safe to compel inhalation; but if you can devote more time to the process, the resistance will be often less.

(Before etherizing, remove false teeth, and loosen a tight dress.)

5. Use, and let hospital attendants use, a good sized bell shaped sponge; and then it may be a question of less rather than more air. The various forms of apparatus which restrict or graduate the quantity of air require more attention and more assistance. Of these, a close bag is the worst. If the sponge is damp, it retains ether better, while the vapor is perhaps a little softer than when absolutely pure. The ready ignition of the latter suggests the precaution of moistening with water the skin and saturated linen before employing near the face even galvano cautery.

(The gravitation of the vapor makes it practically safe by night, if lamps are held above it.)

Keep the pulse in hand; at any rate, examine it often. When the pulse is right the patient is so. With chloroform the pulse may be right and the patient wrong. If slow or feeble, or if the patient snores more than he need, save his strength by giving air—at any rate, until the pulse comes up; but renew the ether before he is sensible of pain. If the pulse shows that he is suddenly faint, lay him down and give him air. Faintness not unfrequently results from nausea, and is relieved by vomiting. In a case of doubtful pulse, a contractile pupil re-assures the operator; a dilated pupil renders him more cautious.

7. If the patient is livid and rigid, give him air.

8. If his glottis contracts, give him air.

9. If he breathes badly, put the finger inside the cheek, to admit air over the base of the tongue.

10. Should he vomit, of which there is usually timely notice, give the matter free exit by turning the patient, if recumbent, well to one side. Although there is less nausea with an empty stomach, it is not well to starve a patient about to encounter a protracted operation.

11. From time to time evacuate the tracheal mucus from the fauces, during an expiration, with a sponge held in dressing forceps.

12. In operations about the nose and mouth, give, for convenience, a powerful dose before beginning. Impreg-

nate the whole circulation to the degree it usually attains in the middle of a long operation. The patient is then easily kept quiet. Otherwise, a volume of fresh blood may find its way to the brain, and suddenly revive him. Let the repeated dose, also be heavy.

13. In these operations, expect blood in the trachea, and evacuate it like the mucus—but, by reason of its quantity, more promptly,

14. Indeed, if such an operation promises much blood, have a tracheotomy tube ready, with hooks to hold the incision open while they compress the veins, so that the tube can be entered by a cut or two in a few seconds.

15. Or insert the tube before operation, and put a sponge in the pharynx. The patient may then be etherized through the tube. I have had occasion to resort to these expedients.

16. In artificial respiration, act with the patient, and not against him. He will not cease to breathe at once, and wholly. Enjoin silence; watch the first attempt at inspiration, and at the expiration compress the thorax, aiding in elastic reaction, if absolutely necessary, by Silvester's or other quiet method. See that the tongue is well forward.

17. Do not cool the patient by exposure and wet surroundings.

18. Being first assured that he can swallow a teaspoonful of water, feed him, if you like with stimulus, during the expiration, but not the inspiration.

19. Give to all painful surgery, without exception, the benefit of anasthesia; but a patient equivocally exhausted by long disease—of the bladder, or of a joint, for example—or an habitual inebriate, may require care; without which, protracted narcotism may gradually depress his pulse beyond the rallying point. On the other hand, a healthy laborer, who reaches the hospital some hours after a railroad accident, cold and literally pulseless at the wrist, from hemorrhage and exposure, is, as a rule, stimulated by the ether during and after at least one amputation.

20. Notwithstanding every expedient, there is occasionally an untoward subject who is habitually tetanic and livid, whenever etherized; or, more rarely, one whose respiration is notably intermittent before he becomes insensible. The latter requires attention. In children, it may added, anæsthesia is cumulative.

Such are some of the minor considerations and prompt precautions which collectively determine the question of life or death in the exceptional emergencies of anæsthesia by ether. Many of them apply with equal force to chloroform; but against the shock of chloroform and its sequences, whether "chloroformic syncope," "cerebral anæcia," or "cerebral congestion," precaution avails nothing.—*Nashville Journal of Medicine and Surgery.*

ARTICLE VII.

Lancing the Gums.

Dr. James Finlayson, in a very elaborate and learned paper on the Dangers of Dentition (*Obstetrical Journal of Great Britain,*) Dec., 1873, Jan. and Feb., 1874,) states that the tendency of opinion at present seems to assent to Dr. West's dictum, that "the circumstances in which the use of the gum lancet is really indicated are comparatively few." Rilliet and Barthez could only recall one case in which any real benefit resulted from the operation, and the best Trosseau could say of it was that the practice was useless. Even the most skeptical, however seem to have encountered rare cases where convulsions ceased on the lancing of the gums; such results are also obtained at times from other most unlikely remedies. It may here be stated that in his careful study of 102 cases of infantile convulsions, Dr. Gee could find no reason to believe that teething bore any part in the causation of the fits, and in none of the cases did it seem necessary to lance the gums.

But it may be said, although the benefit may be very doubtful, why hesitate to give any child the chance of profiting in its peril or suffering by such a simple operation? It is very probable that this idea regulates the conduct of many in dealing with infantile disorders. Such a proceeding has very properly been stigmatized as "nothing better than a piece of barbarous empiricism, which causes the infant much pain, and is useless or mischievous in a dozen instances for one in which it affords relief." It may, however, be well to consider shortly whether the absence of danger from lancing is so complete as is usually represented. And here we may call in evidence the great modern upholder of the practice—Marshall Hall—himself. He was much too consistent an advocate of his own views to ignore the danger of such frequent tampering with the mouth and gums of an excitable infant as he had himself recommended, and he admitted this disturbance as a real and true objection to the use of the gum lancet. Such a course of treatment is indeed well calculated (as an American physician says) to "make your child your mortal foe." But this objection—no trivial one when fully considered—is not all. Local disasters have also happened. Passing by as doubtful any injurious influence on the ultimate growth of the teeth, suppuration and ulceration of the gums, and even gangrene, are admitted by its advocates to have been seen after this operation. Dangerous or fatal hemorrhage from lancing the gums, although not like to be readily recorded, has been published in several cases. Even M. Baumes admits the danger from hemorrhage in incising the gums when much engorged; and he points out that the swallowing of the blood may conceal the extreme peril of the infant. Hamilton, although he had never seen a death from this cause, heard of one on evidence which he could not controvert. Dr. Churchill admits that bleeding from the wound has sometimes been excessive, requiring pressure, astringents, and caustics. Rilliet and Barthez have known it to require plugging. Dr. B. W. Richardson speaks of having

" had two or three very painful lessons of this description," and mentions one death occurring to a country practitioner, and another accident with nearly fatal syncope in his own dispensary practice. Dr. Young, of Edinburgh, narrated a few years ago two deaths which occurred in his father's practice. Fatal hemorrhages have also been reported by Taynton, Anderson, Whitworth, Des Forges, and Nicol, and in only one of these cases was there supposed to be any special hemorrhagic tendency. Further scrutiny of these cases show, as we might expect, that nearly all the deaths were reported under exceptional circumstances, so that many more disasters have doubtless occurred, and have been allowed to slip into oblivion. Without laying undue stress on these perils and calamities, occurring as they do amongst such an enormous number of operations, they may well be seriously considered *when the generalization of the treatment is contended for on the ground of its absolutely innocuous character.—Medical News and Library..*

EDITORIAL. ETC.

The Annual Commencement of the Baltimore College of Dental Surgery.—The *Thirty-fifth* Annual Commencement of this institution was held at the Concordia Opera House, on Thursday evening, February 25th, and despite the inclement weather the extensive auditorium was filled with a brilliant audience, composed largely of ladies. The Stage, as usual on such occasions, was occupied by the Faculty of the College, members of the Graduating Class, and invited guests, among the latter being

prominent clergymen, professors of the different medical schools of the city, and medical and dental practitioners of Baltimore and distant places.

The exercises commenced with a march by the Fifth Regiment Orchestra, A. Itzel, Leader, during which the Faculty and members of the Graduating Class entered and occupied their seats upon the Stage, when Rev. Dr. William T. Brantly, of the Seventh Baptist Church, delivered a very impressive prayer.

The Dean of the Faculty, Professor F. J. S. Gorgas, then read the act of the Legislature of the State of Maryland. authorizing the Baltimore College to confer the degree of Doctor of Dental Surgery, and announced the names of the graduates, seventeen in number.

After music by the Orchestra, which finely rendered a number of operatic and popular selections during the evening, the Degree of "Doctor of Dental Surgery" was conferred by Professor Gorgas upon the following gentlemen, who had been subjected to very rigid examinations on Dental Surgery, Therapeutics and Materia Medica, Physiology and Pathology, Chemistry, Dental Mechanism, Anatomy, and Clinical Dentistry:

	Subject of Thesis.
Reverdy Brook Beall,	*Maryland.*—Mechanical Dentistry.
Charles Campbell,	*Maryland.*—Decay of the Teeth.
John Ernest McBean Chevers,	*West Indies.*—Dental Mechanism.
Joel Beverly Coyle.	*Georgia.*—Diseases of the Teeth.
Erastus Clarence Eversole,	*Virginia.*—Artificial Teeth.
Charles Denny Hilliard Fort,	*Mississippi.*—Dentition.
James Orlando Hodgkin,	*Virginia.*—Dental Hygiene.
Hardy Miles Hunter,	*Texas.*—Dentarius.
James Murphy King,	*Tennessee.*—The Teeth.
Charles Luther Moore,	*Georgia.*—Dental Prosthesis.
Charles James Phillips,	*California.*—Artificial Dentures.
Samuel Dillard Rambo,	*Georgia.*—Anæsthetics.
George Bangheart Raub,	*New Jersey.*—Dental Caries.
Robert Edward Sparks,	*Canada.*—Nitrous Oxide Gas in Dental Operations.
I. Hamilton Thomas,	*Virginia.*—Filling Teeth.
Edward Franklin Wayman,	*Texas.*—The Circulation.
Garner Brown White,	*South Carolina.*—Dental Caries.

After receiving their diplomas the graduates were the recipients of a large number of handsome boquets and vases of natural and wax flowers. The Dean, Prof. F. J. S. Gorgas, was presented with a magnificent cross of wax flowers, enclosed in a large glass case, and which was universally admired.

The Valedictory Address was then delivered by Professor Thomas S. Latimer, M. D., in which he endeavored to impress upon the graduates the value of labor, true manhood, high aims and generous purposes, and above all, loving hearts, pure lives, and readiness at all times to abandon error and follow the guidance of truth, forcibly expressing the noblest sentiments and incentives that should govern professional life. He also referred to the fact that happiness did not consist in making money alone, and advised them to act well their parts and not count too much on human praise It was an able and edifying address, and at its close, the speaker was presented with several beautiful boquets of flowers.

The Valedictory was followed by the Class Address, delivered by James Murphy King, of Bristol, Tennessee, a member of the Graduating Class, which for easy and effective delivery and elegance of composition, has never been excelled on any former occasion. Dr. King commenced with expressing his thanks for the large attendance, then referred to the advantages offered by the Baltimore College of Dental Surgery to students, that it was the oldest institution of the kind in the world, and remarked that through its aid the science of Surgery had been rendered available to women. The speaker also expressed warm thanks to the Faculty for the sympathy and aid always generously extended to the students, and sketching the part of professional duty, pointed out the hill-tops in the march of life toward the temple of distinction, closing with an affectionate farewell to his fellow graduates and class mates. Both the Valedictory and Class Address will appear in the April number of this Journal.

After a medly overture, including Home Sweet Home and Dixie, by the Orchestra, the exercises closed with a benediction by the Rev. Dr R. Hammond

The President of the Graduating Class was Charles L. Moore, of Griffin, Georgia; Secretary, Jas. M. King, of Bristol, Tenn.;

Treasurer, J. O. Hodgkin, of Warrenton, Va; and the Committee of Arrangements, S. D. Rambo, C. D. H. Fort, H. M. Hunter, Charles Campbell, J. B. Coyle, E. F. Wayman, G. B White, J. E. Chevers and R. E. Sparks.

Every specimen set of teeth presented by the candidates for graduation, was constructed of metal' and although manipulation in all the different forms of plastic work is taught in the Baltimore College, not a single rubber set was presented with the theses.

The concluding lectures of the past session and Infirmary demonstrations, were held in the new College building, S. E. Cor. Eutaw and Lexington Sts., which for elegance and convenience, far surpasses any institution of the kind in existence.

The Thirty-sixth Annual Session, will commence on the 14th of October, 1875, and continue until March, in 1876.

The Infirmary is open during the entire year for dental operations.

BIBLIOGRAPHICAL.

Dental Pathology and Surgery.—By S. James A. Salter, M. B., F. R. S. Etc. Publishers: William Wood & Co., 27 Great Jones St., N. Y.

This is another very valuable contribution to dental literature, being a digested collection of the author's previous essays and papers arranged in the form of chapters, to which several not previously published have been added. The work is devoted more especially to Dental Surgery than to Dentistry proper, and the author claims his desire to be, as far as possible the exponent of authorized views and observations, or at least as the result of independent thought and investigation. The subjects treated are: General Anatomy of the teeth, Structure of the

hard and soft tissues, Functions of the Teeth, Abnormal Teeth, Secondary Dentine, Congential Defects, Caries, and other Diseases of teeth, Odontomes, Diseases of Pulp, Tumors and Hypertrophy of the Gums, Dentigerous Cysts, Painful and difficult Eruption of Wisdom Teeth, Alveolar Abscess, Abscess of Antrum, Affections of Nervous System dependent on diseases of the teeth, Facial and General Neuralgia, Diseases of Alveolar Processes, Chemical character and composition of the Saliva, Extraction of Teeth, and Accidents resulting therefrom, and Defects of the Palate. The chapter on "Impaction of Permanent Teeth" is a very important and interesting essay, and the only omission in the work is that of the Development of the Teeth, which in our judgment, should have engaged the attention of the author. The work is embellished with one hundred and thirty three illustrations, and is gotten up in a style which reflects credit upon the publishers.

Treatment of Pleurisy, with an appendix of cases showing the value of combinations of Croton Oil, Ether, and Iodine as counter-irritants in other diseases. By John W. Corson, M. D. Wm. Wood & Co., New York, Publishers.

Vick's Floral Guide for 1875.—As handsome a volume as any which have preceded it. Published by James Vick, Rochester, New York.

OBITUARY.

Eleazar Parmly, M. D., D. D. S., whose death from pneumonia occurred on the 13th of December, 1874, was a native of Vermont, born in the year 1797, the third of five brothers, four of whom became dentists. Dr. Parmly at the time of his death was the oldest living practitioner of dentistry in this country, and commenced the study of his profession in Montreal, Canada, and afterwards with his brother Dr. Levi Parmly, in New Orleans.

In the year 1820 he proceeded to Europe and practised in London, but returned to this country in 1823, and became one of the most successful practitioners in New York city, where he stood at the head of his profession for more than thirty years.

In the year 1847, Dr. Parmly was elected Provost of the Baltimore College of Dental Surgery, having received from this institution his degree of D. D. S. Dr. Parmly was a very intimate friend of the late President of the College, Prof. Chapin A. Harris, M. D., D. D. S., and also of the first President, Prof. Horace H. Hayden, M. D.

In the year 1861 he gave up practice, although he ever afterwards manifested great interest in the welfare of dentistry.

He was distinguished for his virtues and amiability, and was in every respect a gentleman.

The following resolutions were adopted by the New York Odontological Society:

Resolved, That we sincerely mourn the death of our honored friend and professional brother, Eleazer Parmly.

Resolved, That we and the public have lost in him one who in past years was the first practitioner of our city, and the chief ornament of our profession, at once an able and distinguished dentist and Christian gentleman; one who honored and elevated his profession, and did more than any other in his time to make it respected by the community; one whose character and career is an encouraging example to the young men of the profession; whose beneficient influence must endure so long as American dentistry is known, and wherever its ministrations are enjoyed.

Resolved, That we deeply sympathize with the family of the deceased, and that a copy of these resolutions be presented to them and furnished for publication.

Asa Hill, D. D. S., who died of heart disease in Norwalk, Conn., November 25th, 1874, also received his degree of D. D. S. in 1847, from the Baltimore College of Dental Surgery. He commenced the practice of Dentistry in his native place, Norwalk, and continued there up to the time of his death, respected by all who knew him as a Christian gentleman, and leading practitioner. Hill's Stopping, a plastic material for temporary fillings, of which he was the inventor, has made his name well known to the profession.

George E. Hawes, D. D. S., who died in December, 1874, also received the degree of D. D. S., in 1847, from the Baltimore College of Dental Surgery. Dr. Hawes was a native of Wrentham, Mass., and successfully practiced his profession in New York city, from the commencement of his professional career,

up to the time of his death. Besides being eminent in his profession, he was appreciated for all those qualities which adorn and honor the possessor in every walk in life. His name has also become widely known in connection with Hawes Tongue and Duct Compressor, almost universally used prior to the introduction of the Rubber Dam.

JAMES FLEMING, D. D. S., M. D., a native of Washington County, Pa., was for many years the leading dentist of Harrisburg, in the same State, where he died on the 30th of January, 1875. Dr. Fleming graduated in medicine at the Jefferson Medical School, Philadelphia, in 1838, received the degree of D. D. S. from the Baltimore College of Dental Surgery in 1851, and for more than thirty years practiced dentistry in Harrisburg, where he enjoyed the reputation of being a good operator and consciencious, upright gentleman, respected by all who knew him, and whose death will be long lamented by his many friends.

MONTHLY SUMMARY.

Supplemental Nerve Force.—A surgeon of Lyon, M. E. Letevant, has demonstrated, in a work published in Paris, the following interesting propositions:—When a certain group of muscles, supplied by a particular nerve, are paralyzed as the result of a section of that nerve, the motions properly belonging to this group of muscles are not in all cases wholly abrogated, adjacent muscles, supplied by unaffected nerves, being capable of accomplishing some part of the actions, even though feebly. Similarly, when a sensitive nerve is divided, there is not total loss of sensibility experienced throughout the entire region of its anatomical distribution, the sensation being preserved, more or less feebly, either by means of the anastomosis of adjacent nerves, or by the conveyance of impressions indirectly to healthy neighboring cutaneous papillæ.—*Med. and Surg. Reporter.*

False Tongue.—Under the above caption the Visalia (Cal.) *Delta* says: "No doubt everybody thinks he knows what we mean by this heading. But what we do mean is a disease by that name, several cases of which have occurred on Tule River. The patient is taken with itching on the under side, at the root of the tongue, from which we are informed, commences a growth of a fungus resembling a tongue, which soon fills the mouth and protrudes from it, causing suffocation and death in a few days, unless relief is obtained.—*Med. and Surg. Reporter.*

New Sign of Death.—Dr. Monteverdi, of Cremona, recommends what he calls an "easy, prompt and certain" method of demonstrating the reality of death in man. It consists in the observation of a spot produced by the injection of a drop or two of ammonia beneath the skin. If the man be living, the spot produced by such injection is always of more or less vinous red, whilst, if he be dead, the color is scarcely different from that of the skin itself, or at least, has no purple tint. The solution of ammonia injected should have a strong odor of the gas, and a specific gravity of 0-92. If the individual be living, no bad effects are produced, beyond a burning pain, which lasts for a short time, and the reddish tint appears almost immediately. The spot appears to be due to the action of the ammonia on the blood.—*Med. and Surg. Reporter.*

Treatment of Epistaxis.—Dr. W. I. Wilson, U. S. A., reports the successful employment, in two cases of severe epistaxis, of a solution of the liquor ferri persulphatis, one part to three of water, introduced into the nostril in the form of spray, by means of the ether-spray apparatus. The bleeding was checked in a few seconds.—*Med. Times.*

Danger of Chloroform After Chloral.—From a late discussion in the Surgical Society of Paris we find that several members have been much alarmed at the profound stupor which seized patients who, after taking syrup of chloral, are made to inhale chloroform.—*Lancet.*

An Insecticide.—As the best of insecticides, a German chemist recommends a tincture of nux vomica prepared with caustic solution of ammonia. Bedbugs, cock-roaches, etc., are at once destroyed by it, and it is said that if a horse's harness is painted with it, the flies will avoid him! Against ants, castor oil is found an entire protection.

On the Preservation of Leeches.—Many pharmacists have no doubt, found the preservation of leeches a matter of great annoyance and loss.

The more common usage is to place them in earthen jars with perforated covers, and containing a quantity of earth; the leeches looked to occasionally to ascertain their sanitary condition.

I have also known the druggist to place old water-logged sticks, with a few pebbles, in a proper vessel, forming a sort of artificial pond. The leeches free themselves from the slime which collects upon them by drawing themselves through the debris at the bottom of the aquarium.

The following method for the preservation of leeches, has, in my experience, been most successful. Half a dozen "tenpenny" nails are placed at the bottom of a glass jar holding about eight pints—upon them is placed a piece of very porous sponge.

The jar being filled with water, we have an aquarium in which two dozen leeches will live for many months without a single loss by death; a piece of lawn of about one hundred meshes to the square inch should be secured by a strong rubber band to the top of the jar in order to prevent the escape of the leeches.

When the water is changed, the sponge should be thoroughly cleansed, to remove a quantity of slimy matter from the cells.

It said that the presence of metallic iron in water prevents it from becoming putrid. This influence is very marked in water in which leeches are preserved, in consequence of which, the change of the water becomes unnecessary except after long intervals.

The jar containing the leeches should be kept at a comparative temperature of from 55° to 66° F., excluded from sunlight, and a quantity of fresh water added every five or six days.—*The Laboratory.*

Chloral as a Preservative.—"Among the bodies preserved we were shown one, that of a middle-aged woman, injected in February last, and which is still in a perfect state of preservation, without any sign of decay or any trace of an offensive odor. The body looks as if it had been embalmed; that is, it resembles a body in the earliest stage of mummification, and on inquiring how this was effected, we were informed that it was by injecting into the body a solution of the hydrate of chloral in the proportion of one to ten parts. A mixture of carbolic acid and glycerine in the same proportions is sometimes used, but this is not found so efficacious as the chloral."—*London Medical Times and Gazette.*

New Operation for Certain Cases of Cleft Palate and Blind Uvula.—He remarked: At the present time, the operation for closing the cleft in the soft palate, as revived by Roux, and practiced by Dieffenbach, Warren, and others, and materially improved by Sir W. Fergusson, consists in dissecting off the margins of the fissur, bringing the edgee together, and holding them in apposition by suture, and in dividing the tensor and levator palati, and the palato-pharyngei muscles, in order to relieve tension, and place the parts as much at rest as possible, until union takes place, when the sutures sre to be removed.

There are frequently cases met with, however, in which each half of the split uvula and velum is large and thick, and in which the cleft does not extend entirely through the velum up to the hard palate. In such cases I have to recommend a different mode of procedure, one in which no suture is used, and with which, in the two cases I have had, I succeeded perfectly well.

The first case was in May last, in a boy, N. Y., aged ten years. He came from Western Virginia; was healthy in every respect, and allowed me to touch his palate without any discomfort to himself. The uvula was thick, and the whole palate was large, the cleft extending a little above, I thought about a fourth of the way through the velum. I had hardly finished my examination before I thought it possible to practice on this palate what I had seen Nelaton perform in a case of hare-lip, namely, to make an incision from a little below the middle of the right half of the uvula, on one side, and carrying the bistoury up to a point above the arch, of the fissure, and then turning the bistoury, to bring it down to a corresponding point in the uvula of the opposite side.

The column of flesh on either side of the fissure, now liberated by this incision, turns on its attached pedicle, or falls from the arch, leaving a long uvula with an oval opening in its base.

This operation having been practiced in the case referred to, in a few days granulations sprang up, and the parts contracted. A day or two later, when the upper part of the wound began to widen, I divided with a double-edged knife the tensor and levator palatia muscles, as recommended by Sir W. Fergusson, thus removing all tension, when the upper edges of the trapezoidal-shaped opening approached the median line; and under the application of a little nitrate of silver, cicatrization and narrowing of the entire opening rapidly ensued.

Malignant Pustule Produced by a Fly-bite.—The patient, a coachman, was conscious of being bitten by a fly on the 28th of March last. The puncture was inflicted in the temporal region, and a minute mark was left by it, not unlike a flea-bite, at which point some itching was experienced upon the following

day. Upon the evening of the 20th, a swelling appeared in the temporal region, which extended over the entire face, becoming so intense that, upon the evening of the 30th, the eye-lids could no longer be parted. April 1st, he was received into the hospital, upon which occasion the characteristic black eschar was noticed surrounded by a coronet of vesicles. In spite of the most heroic treatment [incisions and cauterization,] no decided relief was obtained, the swelling and gangrene slowly extending until the left eyelids, the soft tissues of the nose, the lips and the left ear all sloughed and became detached, imparting to the face the appearance of a hideous mask. Death finally ensued May 10th. No trace of bacteria could be detected either in the blood, nor the serum of the vesicles, and the inoculation of rabbits with the blood was followed by negative results.—*Lyon Medical.*

Lock-jaw and Quinia.—Several cases of tetanus have followed hypodermic injections of sulphate of quinia, which will render medical men more careful in thus employing it. M. Bourdon says the following preparation is not irritating, and may be injected without danger: By weight, sulphate of quinia two parts, tartaric acid one part, water forty parts; mix.—*Scientific American.*

A Patent Decision Affecting Dentistry.—For several years past the dockets of all the United States Circuit Courts have been crowded with suits brought by the Goodyear Vulcanite Company against dentists, for infringing the Cummings patent, covering the hard rubber plates used for inserting artificial teeth. Between 2,900 and 3,000 suits have been brought against infringers of this patent. Judge Emmons, in behalf of the U. S. Court, of Michigan, has just rendered an opinion fully sustaining the validity of the patent.—*Med. Rec.*

Precautions Against Trichina.—The Medical Society of Kalamazoo, Mich., gives the following advice: Eat no uncooked or half-cooked hog's flesh. The raw flesh of a hog, whatever its shape or condition, whether ham, bacon or pork, salt or fresh, smoked or un-smoked, is liable to contain this parasite, full of life and activity, that may work a remediless mischief in the human body. Bologna sausage, if pork be in it uncooked, is as dangerous as any form of this meat. The heat that cooks meat utterly destroys the life and mischievous power of these vermin, and no one need fear any harm if this fact is observed.—*Med. and Surg. Reporter.*

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ARTICLE I.

Valedictory Address

BY THOMAS S LATIMER, M. D., PROF. OF ANATOMY.

Delivered at the Thirty-Fifth Annual Commencement of the Baltimore College of Dental Surgery.

It is I believe the uniform custom in all colleges at the close of the collegiate year, publicly to present to the graduating class the diplomas which testify the efficient discharge of their duties as pupils, and, in schools teaching special branches of science as a vocation, assert their qualification properly to discharge the duties it involves.

In accordance with this time honored custom we are met this evening, and the duty has devolved on me to speak the few words of advice and encouragement usual on these occasions. In casting about for a theme of interest, I could think of none better than the familiar one, trite and commonplace enough to all those who have passed this period of their lives, but I believe always of living interest to the graduating class. I remember with what profound atten-

tion I, at the same period of my life, listened to the advice then spoken, though I can not now suppose it was at all novel, nor characterized by any especial eloquence.

I trust therefore in attempting plainly and simply to point out to you the nature and purpose of your life work, and the principles by which you should be guided in its execution, I may not altogether fail to interest you. I do not mean to speak to you as dentists of the work belonging to your especial duties, but as men of that which concerns you in common with all other men.

It has been said that no man is truly happy until his pleasure grows out of his work, as naturally as does a color petal grow out of a flower. This no doubt is a saying difficult for you to understand, and for years to come more difficult for you to feel. It is however a great truth which you must sooner or later learn if your happiness is ever to be established on a sure foundation. The many alluring phantasms of pleasure which in early life we so eagerly pursue, are all transitory and in dying dower us with a "harvest of barren regrets." But work, real true work, into which a man's heart and soul enters is its own exceeding great reward, but it must be pure in its purpose as well as strong in its strife, and with divine affections bold to follow wherever it shall lead. Many of you, perhaps most of you, have chosen your vocation with a view simply to making an honest livelihood, not recognizing in life any nobler purpose than the attainment of worldly success. There is however, true work and false work, heroic work and unheroic work for every man alive whatever his vocation. It behooves us then at the outset of our careers, to find what is the true and heroic, and to seek it, and it only, thenceforward. I know none of you require to be told of the unfruitfulness of idleness; of that as practical men in a work, a day world you are well assured. In idleness alone there is despair; but in him who actively and earnestly works, though mammon were his God, there is hope; but alas! if this be the God of your idolatry, there is only hope

An existence of play sustained by the blood of other creatures, as such an existence needs must be, answers very well for gnats and sucking fish, but not for men; neither days nor lives can be made holy by doing nothing in them. Man is born on a battle field and it is appointed unto him to wrestle not to reign, and it is well with him if after toil and strife he may reach a purer air. It is with all things worthy to be had, as it is with the metal gold; nature might have placed it upon the surface of the earth where all who sought might find it with ease; but she chose rather to bury it deeply in the bowels of the mountain, where you must dig long and painfully to find any, and may dig long and painfully and find none. Yet it is the work that blesses man with increase of strength, rather than the gold to which he attains, for "God in cursing gives us better gifts than men in benediction," and God says sweat for brows; thus then can we understand the wise injunction: "Get work, get work, be sure 'tis better than what you work to get."

Mr. Ruskin has truly and beautifully said, "Every man has a true and a false life. His true life is like that of lower organic beings, the independent force by which he moulds and governs eternal things. It is a force of assimilation by which he converts everything around him into food, or into instruments; and which however humbly or obediently it may follow the guidance of a superior intelligence, never forfeits its own authority as a judging principle, as a will capable of either obeying or rebelling. His false life is indeed but one of the conditions of death or stupor but it acts even when it cannot be said even to animate, and is not always easily known from the true. It is that life of custom or accident, in which many of us pass much of our time in the world; that life in which we do what we have not purposed, and speak what we do not mean, and assent to what we do not understand; that life which is overlaid by the weight of things external to it, and is moulded by them instead of assimilating them; that which

instead of growing and blossoming under any wholesome dew, is crystalized over with it as with hoar frost, and becomes to the true life what an arborescence is to the tree, a candid agglomeration of thoughts and habits foreign to it, brittle, obstinate, and icy, which can neither bend nor grow, but must be crushed and broken into bits if it stands in our way. All men are liable to be in some degree frost bitten in this sort; all are partly encumbered and crusted over with idle matter, only if they have real life within them they are always breaking this bark away in noble rents until it becomes like the black strips upon the birch tree, a witness of their own inward strength." Though all men have not that inward strength which enables them to break through the environments of time and circumstance, and mould them to their will, yet all have power for striving, and though they may not wear the laurel, they may feel that they have contributed something, though but a widow's mite, to the widening of men's thoughts.

> " At least not rotting like a weed,
> But having sown some glorious seed,
> Fruitful of further thought and deed."

With the old monks it used to be said—*laborare est orare*—to labor is to worship—and it is a saying worthy of all acceptance. It is indeed the only worship wherein God manifests himself. Prayer and praise and thanksgiving are well, but they are only means to an end. Means by which our lives are framed on principles of active benevolence, that we may go about *doing* good, not dreaming it all day long. Nursing " dainty sympathies in some delicious ease" is well if that they finally grow into fruit of generous action. An old Mahomedan maxim commends itself very strongly to my judgment—" One hour spent in the execution of justice is worth a thousand years of prayer." Thought and sentiment are well, but only in so far as they prompt to action, for the life of man is properly an action, and not a thought though it were the noblest. All *true* thought is convertible into action; it is indeed the test of its truth that it is thus

convertible. The life of all Gods figures itself to us as an earnestness of infinite battle; battle for the true and good against the false and evil. Everywhere in nature is ceaseless activity; there is a mill wheel for the tiniest rivulet to turn; but not the less may it break into dimples and laugh in the sun, than when it dances over the sandy shallows. Destiny has indeed no other way of moulding us into shape and use. Set even a formless chaos rolling and a world is born. He then who has found his true work, his life purpose, has found the true source of all blessedness, of all hopefulness, of all knowledge. "The knowledge that will hold good in working cleave thou to that, for nature herself accredits that, says yea to that. Properly thou hast no other knowledge but what thou has got by working; the rest is all a hypothesis of knowledge; a thing to be argued of in schools, a thing floating in the clouds in endless logic vortices, till we try it and fix it. Doubt of whatever kind can be ended by action alone."

But the question recurs to us, what is true work, and what is false work, and how are we to elect in a world where so much is thrust upon us in which we have no choice?

The first great aim in every man's life should be to determine his capabilities. To ascertain in what particulars, and to what extent he is qualified to work, and then to do it with all his might, and from other motives than that of gain. To learn the nature and extent of our capabilities is no doubt the most difficult thing we can find to do. Carlyle in his pungent way says, alas! our young son is all budding with capabilities, and we see not yet which is the main and true one. Always too the new man is in a new time, under new conditions; his course can be the *fac simile* of no prior one, but is by its nature original. * * * Thus in a whole embroglio of capabilities, we go stupidly groping about to find which is ours, and often clutch the wrong one; in this mad work must several years of our small term be spent, until the poor blind youth by practice, acquire notions of distance, and becomes a seeing man. Nay, many

so spend their whole term, and in ever new expectation, ever new disappointment, shift from enterprise to enterprise; till at length as exasperated striplings, of three score and ten, they shift into their last enterprise, that of gettine buried."

It is perhaps well for us that rigorous task master Hunger thrusts us into some form of employment before we have settled this question. For indeed it may be doubted whether any solution can be had save in and through labor. It will not do to ponder too long what we are qualified to do, but rather experimentally test that which is nearest to hand. Thus will vague wavering capability soonest become converted into fixed indubitable performance which is indeed the " mirror where in our soul sees its natural lineaments, for it is only by what we have done, that we come to know of what we are capable.

I do not counsel you to despise the getting of money; it is helpful and needful in all life whatever its aims and tendencies. Put money in your purse is an injunction to be by no means despised, yet the true wealth of a man is the number cf things which he loves and blesses, which he is loved and blessed by. Every good man, it has been well said, holds his life in his hand ready to give it for a noble purpose, not to sell it. Too much time is necessary to accomplish any useful purpose to spend much of it in counting the profits to accrue from it. We get no good by being ungenerous, even to a book, and counting so much profit from so much labor; it is only when we gloriously forget ourselves and plunge headlong into its pages enamored of the salt and savor of life in it that we attain to the essential good it contains.

The element of love then necessarily enters into all true work, and just in proportion as that love is pure and unselfish is the work born of it good and pure and enduring. In the earlier days ot our lives even the best workers love the ends of work better than the work itself. Wealth and power and ambition are the potential motives that prompt

to action, sustaining and encouraging us in the early drudgery that belongs to the alphabet of labor. A. B. C. were nothing but drudgery if it did not open vistas of volumed wealth that are to reward that early toil. Nor are these in themselves unworthy motives. If the wealth is sought for benificent ends; the power to suppress the wrong and uphold the true; the pride of place be that the place whereon we stand, be it a heaven kissing hill or a lowland valley, be the place where justice may be done and prayer and thanksgiving may ascend, then are these motives worthy in themselves, and the work growing out of them has in it an element of truth, but if real work is to be done, work wherein our hands shall not tire nor our hearts grow weary, we must superadd to these, love of the particular work itself. The sculptor must love sculpturing more than the fame or wealth accruing, however worthily both may be made to subserve noble ends; the painter must love the creations of essential beauty more than the award of the academy, before marble shall breath beneath his chisel or canvas glow with the inspiration of his genius.

It is physically impossible for any well educated, warm hearted and brave man to make money the chief end of his being. All men love to make money and properly. Every good soldier likes to receive his pay, and the best of them will grumble not a little if it is withheld, but the chief purpose of his life is to win battles, not to receive pay. If pay is the end, slavery is the means, it matters not whether we are bought with praise or gold. The distinguishing sign of slavery is, to have a price and be bought for it; the distinguishing sign of heroism is to have an aim and if needs be, to die for it. In the pursuit of truth, sorrow and privation must be borne; but what need he care who "stands upon some lofty mountain thought and feels his spirit stretch into a view" that round him are icy rocks. His soul is singing at a work apart behind the walls of sense, and truth is given him for sole vision, let contending tempests blow never so sharply about his naked head.

True work then is work that we love; it is the fashioning of our souls into whatsoever may be the product of our minds and hands, expressing in it our highest capabilities in the direction in which we have sought to engage our energies, and that equally, whether it be in the plugging of a tooth, or in the redemption of a land. If that which we do is that for which we are especially fitted, and in doing it we have made no reservation of our powers, we have attained the limit of heroism in the daily avocations of life. "Act well your part, there all the honor lies." It matters not what the part may be, the honor lies not in it, but in doing it well. Therefore "produce, produce though it should be the pittifullest infinitesimal fraction of a product, produce it in God's name."

There can be no disguising the fact that much of weariness and heartsoreness enters into labor; that there are times when even "the labor we delight in" will not "physic pain;" but alas! into all life does heartsoreness enter, yet busy brains and active hands, erect against it the most formidable barriers.

While something of worldly prosperity is unquestionably essential to the happiness of all ordinarily constituted mortals, yet it is equally true, that if out of the rugged block of adversity you have carved nothing but a stout statue of prosperity to set up among your household gods it will never lay happy hands upon your head in benediction. No man shall or should barber the true and beautiful for barley feeding and material ease, and be happier therefore. If the gratification of your pride be the object of your labors, it will defeat its own object. Do what your hands find to do reverently, because all perfect work presupposes reverence. Enthusiastically because God within us, is the only way to get God within it; and, if you esteem the work you are set to do as a sacrafice of your lives, remember that it is only when sacrifice is offered with "liberal joy" that it is acceptable to God or a theme of praise among men.

Every man worthily striving fails not of here and there a little success to keep him in heart; a kindly spoken well

done to cheer him ere he has learned to dispense with cheer, but it comes more surely if it has not been sought as an end. Yet he who strives most earnestly, with the purest heart and strongest brain, must ever find "an infinite void twixt the absolute aim and the partial achievement." Checks and disasters grow in the veins of action highest reared; * * * and every action which has gone before where of we have record, trial did draw bias and thwart, not answering the aim, nor that unbodied figure of the thought which gave it surmised shape." Yet no true man falters for these reasons: What though the arrows of his aim are blunted, and the needs of his trust are broken, still must he gird himself anew for the strife, accounting it nobler to have fallen in front rank and be overtrodden by the abject rear, than to have done and hang like a rusty mail in monumental mockery. Who is it that would not rather, like the roman general, wear his "honor owing wounds" hid 'neath his mantle, than expose them in the market place, and for that he wears them, receive the most sweet voices that declare him consul? If such there are among you let him never be a seeker after truth. The quest is not for him. If prompted by a passing impulse, he should vow a vow that for a twelve month and a day he will follow truth, his vow shall not save him from following wandering fires.

The quantity of work done and forgotten, writes Mr. Carlyle, that lies silently under our feet in this world, that escorts and attend us, supports and keeps us alive wheresoever I stand or walk, whatsoever I think or do gives rise to reflection. Is it not enough to strike the thing called fame into total silence for a wise man. Scarcely two hundred years back can fame recollect articulately at all; and there she but maunders and mumbles, she manages to recollect a Shakespeare or so, and prates considerably like a goose about him." It is indeed only here and there from all past time that we encounter a name at whose mention "oblivion shrinks like a thing reproved," and if any among you shall give such loose rein to his fancy as to dream of

being one among the least of these, let him remember that not only is the mighty genius needed but also the martyr's spirit ere he can be accounted worthy to share their "grand adversity." Let me advise you then, whatever the aim or purpose of your lives, not to

> "Count too much on human praise
> That comes to guerdon after days."

Perhaps the sublimest picture in human nature, is that of the philosopher Kepler, rejoicing at the discovery of a truth, when after seventeen years of struggle, "full conviction burst upon his mind; he had won the goal, the struggle of seventeen years ended, God was vindicated, and the philosopher in the wild excitement of his glorious triumph exclaims:

"Nothing holds me. I will indulge my sacred fury. If you forgive me I rejoice; if you are angry I can bear it. The die is cast. The book is written, to be read either now or by posterity; I care not which. It may well wait a century for a reader, since God has waited six thousand years for an observer."

Intellectual work, what we call study, needs no praisers, it is itself a satisfaction of all wants. It is wealth in poverty, liberty in bondage, health in sickness, society in solitude. It consoles sorrow, assuages pain, brings gladness to eyes that fail with wakefulness and tears, and ache for the dark house and long sleep. "Surely, says McCauley," "it is no exaggeration to say that no external advantage is to be compared with that purification of the intellectual eye, which gives us to contemplate the infinite wealth of the mental world; all the hoarded treasures of its primeval dynasties, all the shapeless ore of its yet unexplored mines."

But in addition to the satisfaction of our material wants, the gratification of ambition, and the love we ourselves have for the work we have set ourselves to do; there are two other essential elements in all perfect work. 1st. That no pitiful envy of another's success should be possible to us.

Not only because remembering that "emulation hath a thousand sons," and that we must often be outstripped in the race for truth and lose the honor of its discovery; and that if we admit a thing so blind, embrace it as our natural good, it must prove a serpent to sting us from our peace; but because you have not, and can not have that perfect love for the object of your pursuit which alone entitles you to succeed, if you are not glad to see it attained more closely even by your most formidable rival. It is not an august inward impulse which prompts your action if the superior success of another rankles in your bosom. It has been beautifully and truthfully said, by Mrs. Browning, when considering Cimabue, contemplating the superior merit of the shepherd boy, Giotto's, sketches:—

"I hold, too,
That Cimabue smiled upon the lad,
At the first stroke that passed what he could do,
Or else his virgins smile had never had
Such sweetness in it. All great men who foreknew
Their heirs in art, for arts sake have been glad,
And bent their old white heads as if uncrowned,
Fanatics of their pure ideals still
Far more than of their triumphs."

Great success in anything, the smallest, is not possible for littleness, and envy is the brood of little minds.

There is room enough in this fair world for the weakest man in it to live and die, as well as for all the strongest to live well, and strive their own way by their individual heat, seeking their own ideals.—

"The ultimate perfection leaning bright
From out the sun and stars to bless the leal
And earnest search of all for fair and right."

The last important element in the character of true workers to which I would call your attention, especially if their labors lead them in the direction of investigation rather than in the application of that which is known to the daily uses of life, is a divine courage to accept and boldly to acknowledge that which reason has determined to

be true. The earnest seeker has naught to do with likes and dislikes. He has no right to hesitate to accept aught because his emotional nature says no to it. What he has to do first of all is to divest himself as entirely as is possible for a human being of all pre-conceptions, and to examine each fact or theory upon the examination of which he may be engaged, by the pure white light of reason, and when reason says yea to it, there is nothing authorized to say nay. "This is a repulsive, a revolting doctrine, I will not acccept it" is too often upon the lips of avowed seekers after truth. It matters not how revolting, with that you have absolutely nothing to do. The sole question for you to ask is, is it true? and if the answer be yea, and you hesitate to accept it because it is not what you would like to be true, you are recreant to all virtue. Nor would I counsel a too hasty acceptance of alleged facts:

> "Ran haste is half-sister to delay."
>
> "Hold fast the good, define it well,
> For fear divine philosophy
> Should push beyond her mark, and be
> Procuress to the lords of hell."

Yet whilst holding fast the good, do not ever suppose it separable from the true, nor hesitate to loose that hold the moment reason and judgment shall say, "that which thou holdest for truth is not truth, but error." It is a base abandonment of mind to resign our right of thought, and a baseness which meets the penalty due to baseness. I know of no sadder sight under heaven than to see a strong man holding to his heart the delusion once dear to him as a living truth, but now incapable of giving or receiving warmth. Nor can any truth long remain obnoxious to the zealous lover and worker of good. Free thought and bold are alone the instrumentalities by which the obscure can be made plain, and the darkness be converted into light. A thinking man, if his heart be pure, is the greatest enemy the prince of darkness has to encounter. It pre-supposes

and includes a brave heart. The motto inscribed upon his banner is, truth though the heavens should crush me for following it; no error though a world should account it good.

Honorable industry then sums up the aim and end of a good man's life. All earnestness and industry will be useless, unless they are consecrated by your resolutions to be in all things men of honor; not honor in the common sense only, but in the highest. * * * Though it be not exacted of you, yet exact it of yourselves, this vow of stainless truth. Your hearts are, if you leave them unstirred, as a tomb in which a God lies buried. "Vow yourselves crusaders to redeem that sacred sepulchre;" remembering that in all things, "your strength shall be as the strength of ten," if that "your hearts are pure."

Yet I would not figure life to you as altogether a continuous strife, though it be in the acquisition of knowledge, the determination of truth, the dissemination of good, the purification of self. Rest and play, mere rest and play are constituent parts of a life well spent. Though work be our highest and most enduring pleasure, it need not be our sole pleasure. "The full face of the soul turned hopefully and steadily toward the true, must catch across its ridge the idealized sunlight of the beautiful." Having tilled the soil and sown the seed, we may stretch our limbs at noon and "Tranquil *muse* upon tranquility."

> While the warm wooings of the sunny day
> Tremble along the frame and harmonize
> The attempered brain, that even the saddest thoughts
> Mix with some sweet sensations, like harsh tunes
> Played deftly on a soft toned instrument.

The sun should be our type of a great worker; its high office to guide the earth through the heavens and warm it into fruition; yet it does not disdain to "add a color to the rose," to throw a perfume o'er the violet," to enchant the winds to music 'till the listening spirit walks—

> "Exempt from mortal care
> God-like o'er the clear billows of sweet sound."

If it never swerves from the path of duty, nor admits a stain upon its spotless crest, it counts it no shame to lie like a loved locket upon the bosom of a quiet lake, "and make its silvery splendor pant with bliss."

Moving straight on it rejoiceth like a strong man as it goes. Work and play, alike perfect after their kinds, each unassoiled and unassoilable. Make it your model; work as it does zealously and purely; rejoice as it does afar from "The purple lined palace of sweet sin," and your days shall be full of peace.

And now it only remains for me to say good bye! trusting that so much prosperity may be accorded to each of you, as is consistent with the most perfect development of your highest capabilities, and no more; to leave with you in the name of the Faculty of the College, the benediction of your *alma mater*, and for myself to thank you for your patient attention.

ARTICLE II.

Class Address.

BY JAMES MURPHY KING, D. D. S.

Delivered at the Thirty-Fifth Annual Commencement of the Baltimore College of Dental Surgery.

Ladies and Gentlemen:

There are points in the circle of life—eventful days and moments in which are crowded the joy which shall compensate for years of weary toil and patient endeavor, which have gone before, or may come hereafter.

There are oases in the desert, beneath whose cool palm tree Eve may rest and drink the waters sparkling and purer while by memory's light we retrace the sands over which our weary feet have toiled through days of burning heat; or linger near the solitary tree which has sheltered our head by night.

There are hill tops in the march of life from whose summit we may sometimes look into the distance which stretches out before us, bright as a poet's dream, fair as October skies.

In the brief hemisphere bounded by the horizon of time, such moments come not often.

It is only after many burning marches that we may sit by the murmuring waters and feel the breath of the palm. It is only after years of toil that we may reach the summit and survey the enchanting scene beyond.

Only he who dares the hero's march may win—only he who has the courage to brave the thorn and rugged rock and dark ravine, may pluck the laurel from the mountain brow.

As we stand to-night in the green of the oases, as we gaze from the mountain brow into the vista which lies before, as a class, we greet you; as a class who have just received the prize for which we have toiled, we thank you for your presence here to night; and in sundering the ties which bind us to each other, and to a Faculty, to each of us endeared, we rejoice that to you no such as word "farewell" must be uttered.

To you we dedicate our lives and our professions—to the good of humanity we consecrate our time and our talents.

I need not to-night review the past of Dentistry—I need not tell you the successive steps by which it has emerged from the dreary night of ignorance and sloth—I need not tell you of the heights to which it has attained—you know it all.

From this stage in days gone by, you have listened to words "which fell like wintry snow" from tongues born to speak, and the perfume of beauteous flowers, and the bright smiles of more beauteous ladies have made known the feelings of your hearts. You know it all. Here in your midst rises like a beacon upon a rocky shore, the oldest College of Dental Surgery in the world.

You have known it from its birth, you have known its childhood and you know its manhood prime. You know

where its graduates are to-day,—men from every quarter of the globe, and filling chairs in almost every dental college in the world. You know *who* they are—men of the highest order of education and qualification, men who are competent to elevate and enable whatever their hands find to do.

No, I would rather glance down the vista of the yet to come—and point you to the good which remains to be done and the many strong arms and willing hearts who stand ready to perform it.

And now, woman, with her practised eye and cunning hand is beginning to realize that she has a mission to perform,—that the gates of Dentistry lie open to her, that she may by her presence elevate and honor it, and teach her sisterhood that woman, as well as man, may aspire to something higher and more noble than the relating of the latest gossip, or the discussion of the latest fashion. That aside from her one great and glorious mission on earth, as the companion and helpmeet of man, to bless his pathway, comfort his sorrow, and lead his footsteps heavenward—to mould the mind of infancy, filling it with pure desires, noble aspirations and beautiful hopes; she may in a different sphere glorify her God and benefit her race—administering to the suffering and needy, and as a sister of mercy and disciple of Christ, add her hand to the few but noble hands which are striving to lift the burden from off humanity, the burden of suffering, and sin, and woe, and bring back to earth lost Eden's bloom.

Once more kind friends we tender you our most grateful thanks for your presence here to night, for the kind regard as manifested during our sojourn in your most pleasant city, and for the approving smiles and flowery tributes with which you welcome us on this our Thirty-fifth Anniversary Night.

Gentlemen of the Faculty; the time has come in which must be severed those familiar and pleasing relations of preceptor and student, which have existed during so many months, and we now upon the eve of going forth into the

bivance of life, would recall as we shall do many times in the future, the sympathy and courtesy which has ever marked your conduct toward us, and the faithful manner in which you have performed the duties to which Providence has called you; guiding us step by step up the steps of science, taking us as we came to you, raw recruits, and sending us forth to-night thoroughly drilled and fully equipped for our life work.

Gentlemen, a word, a deed, an influence is deathless,—overleaping the shore of time, it is born on the billows of eternity's ocean beyond the judgment day, and we may meet it again somewhere in the infinite future. The influence you exert, the work you do will live forever.

We have sat at your feet in these earthly halls as patient learners; we have looked with you to the rewards of the future; may we one day meet again in the Eternal University, and together sit as students at the feet of the All-wise Teacher. Gentlemen of the Faculty— Farewell.

Fellow Students.—Before I close it becomes my pleasant duty to speak a few words relative to the responsibilities and imperative duties that are resting upon you as dental practitioners.

As strangers, we meet at this fountain of instruction for one common purpose, to lay the foundation of that knowledge upon which our future success to a great extent depends. As students, we have been exceedingly fortunate; we have sought and enjoyed the instructions of the oldest Dental College in the world. We have been assisted by the long experience and acknowledged talent of a diligent Faculty, who are efficient in almost every branch of medicine and general surgery, as well as what constitutes the peculiar and distinguishing characteristics of our own special art and science. Our facilities and multiplied appliances for instruction have been full and complete.

Our course of instruction and discipline has been rigid and comprehensive. But complete and thorough as may have been our dental preparations, we have only entered

upon our works. We have only laid the foundation upon which to build the monument of our future character and reputations. We have only learned the alphabet of that language, which by assiduous study and diligent cultivation, will disclose to us the beauties, solve the problems, and unlock the hidden treasures of that excellence for which I would bid you strive.

By assiduous study, and manipulative dexterity, we have at last reached all the requirements of graduation as Doctors of Dental Surgery; and we are here to-night to receive from our *alma mater* the reward of our diligence, and to be admitted as worthy members of that special branch of the great art and science of medicine which we have chosen as our profession. And shall our labors stop here? Shall this close our students life? Shall we lay aside our books and conclude that our work is done, that we have nothing more to learn; that we have mastered all the requirements and compassed all the resources of our profession? I trust that there is not one on this stage to-night, who is so dead to enthusiasm, so utterly destitute of ambition as to be satisfied with his present minor attainments.

In severing our connection with this institution, let me admonish you with all earnestness never to let your interest and diligence abate, or your efforts and energies relax, while there remains a single theoretical problem unsolved, or an important practical question undecided. Your diligence and energies instead of abating, should be increased; your research should be more earnest, and assume a more expansive range. You should lend a helping hand in exploring the yet untrodden fields, and solving the yet complex and abstract problems of Dental Science.

As we go forth into the mystic future to meet life's duties, it should be our ever animating spirit and controling power to multiply those resources and augment that knowledge which we have already acquired, and thus "to fulfill the hopes and redeem the trust so confidently reposed in us by our friends and instructors. If we ever attain professional

excellence, we must never cease to be students. The imperative is upon us all to labor if we shall ever approximate the "*Ultima Thule*" of our profession—"*Labor omnia vincit.*"

We should consider the passport which we have to-night so joyfully received from the hands of our Dean, not only as a reward of work performed, but rather as an evidence that we are worthy to be admitted into a more useful and extensive field of labor; the diligent cultivation of which will yield to us the highest honors and brightest rewards the world can offer to genius and talent.

Dentistry has but lately arisen to that high status which it now occupies among the learned, artistic and scientific professions. It has but lately received that consideration and esteem which it now so justly merits as a legitimate and honorable specialty of the science of medicine. This being the case, it is imperative upon each one of us to assist in maintaining its high position and to give to it additional reputation. Let us see to it that we not only keep abreast with the progress of the times, but that we leave our footprints on the domain of science.

Gentlemen of the graduating class, a few words more, and I must say to you that word so often uttered on earth sometimes coldly or carelessly, sometimes with beating heart, and eyelids moist—sometimes with bursting sobs—"farewell." The echo of that farewell will ere long die upon the air forever, but not so upon the heart; there it will live while memory lasts, and whenever that word is spoken in the future, it will recall this parting night; it will recall the hours in which we have toiled together here, and our pleasant converse by the way.

We go, but we go to life and to duty. We go to an unknown future, but to each of us it may be a useful future, filled with earnestness and toil and hope of consecration to our work to humanity and to God. And then when life's brief day is rounded with a sleep, we may sink to rest as calmly as a summer's sun.

There is nothing that can soften a dying bed like a well spent life, nothing that can make the rest of heaven so blest as a life of toil and trial; nothing that can make the songs of glory so sweet as the wail and moan of earth: nothing that can make the everlasting hills so bright with the sunlight of eternity as the darkness and gloom of time.

Gentlemen of the Graduating Class—Farewell.

ARTICLE III.

Operative Dentistry.

BY S. J. COBB, D. D. S.

Mr. President and Gentlemen of the Southern Dental Association:

Finding my name first on the list of names composing your committee on Operative Dentistry, I feel it my duty to make some sort of reply. Not that I have anything new, or that I feel so well calculated to interest and entertain you upon this important subject, but that I wish to call attention to some extremes that a good many have reached in this department. For instance,—many of our leading dentists have abandoned the use of non-cohesive gold for filling teeth; in fact I am told that some of our colleges have become so indifferent to its use that they graduate many of their students without giving such instructions as will enable them to make a passable non-cohesive filling.

Gentlemen, when we look back over the history of dentistry and see the number of teeth that have been preserved ten, twenty, thirty and forty years, by filling them with non-cohesive gold, made into cylinders, blocks and strips, it is hard to understand how it is that so many have given up this old preparation of gold, as well as the good old ways of using it, and taking up with cohesive gold and the method of using it, which has not been in use but a few

years. I hope I have not been correctly informed in regard to our colleges, for I assure you, I am slow to believe that our substantial educators are willing to give up long and well tried materials and ways of using them, until a sufficiency of time has elapsed to demonstrate clearly the superiority of new materials and methods of using them.

Cohesive gold is a very good thing in its place, but when used to the exclusion of non-cohesive it is frequently found out of its place. It is evident to me that it requires less time and skill to make a good non-cohesive filling, than it does cohesive, and as no one contends that a better filling or stopping can be made of it, in a very large majority of cases, I see no reason why any one should abandon its use. Requiring as it does the highest order of mechanism and skill to make a perfect stopping or filling with cohesive gold, and cannot be done then without true access to the parts operated upon, it is strange indeed that so many of our colleges should become so indifferent to the use of non-cohesive gold.

Requiring as stated above less time and skill to make a good filling of it than cohesive, the operation is certainly more simple and easier performed, as such should always be preferred in all plain simple operations. It seems to me that the light of our ambition should be to simplify and make plain every operation we perform on teeth, in order that all who engage in our profession should be able to do as much good as possible, but I am sorry to say that such does not seem to be the case at present. We have not only gotten a little crazy upon cohesive gold, but several other things, the mallet, rubber dam, contour fillings, machinery, and other things come in for their extreme advocacy. All of these things are good in their place, the trouble is some use them on all occasions, and condemn others that do not likewise. While the rubber dam may be indispensable in some operations, I cannot find use for it every day, neither do I find use for the mallet to drive gold into every tooth that I fill. The White and Morrison Engines are very

convenient little machines to have in a dental office, but like all other good things need to be used in their place. Contour fillings well made of cohesive gold in practical cases are not only beautiful but necessary, but, I must say that practical cases are not very numerous.

I have made in the last ten years a great many contour fillings, and I am sorry to say, many of them have not proven to be quite as practical or serviceable as I would have had them. While this has been my experience, I have observed the same kind of failures made by the best of operators. Hence I have come to the conclusion that so much of this building up and restoring the crowns of teeth to their original shape and contour is not quite as practical or durable as is desirable. In my efforts to investigate these failures I find that most of them are attributable to two causes: The first is the want of a perfect adaptation of the gold to the walls of the cavities, or in other words a perfect stopping of them. The second is the want of cleanliness, resulting from the close contact of such teeth.

All teeth operated upon should be left as near self cleansing as possible, all proximal surfaces that come together after being operated upon will sooner or later decay again; as such it is important that such surfaces should be operated upon in such a way as will prevent this coming together again. I merely call attention to this extreme practice, such as, impracticable contour fillings, unnecessary use of the rubber dam, frequent heavy malleting, the use of machinery for every thing, and especially the exclusive use of cohesive gold for filling teeth, for the purpose of eliciting a little thought in this direction. A few words in regard to materials for filling teeth.

Our Dental goods manufacturers are very energetic and industrious men; they are not only providing many things for us to fill teeth with, but putting them into every conceivable shape and form that will facilitate our operations. Gold cohesive and non-cohesive is put up in various shapes and forms, so as to be suitable for all kinds of operations

made by the various operators. If one should want very heavy foil he can get what is called No. 240, that is to say 240 grains in a sheet not more than 3½ inches square, then if any other should want very thin or light, he can get the same size sheet containing only 3 grains, others may get crystals or sponge gold, as well as cylinders, blocks, pellets, or corrugated foil. I have recently made some experiments with what is called Platina blocks, also foil, and I am sorry to say, my experiments were not satisfactory. I am satisfied that the Platina blocks and foil as a material for filling teeth is a failure. The blocks are intended to be cohesive but there is not enough gold on them to make them weld together perfectly. The foil worked in cylinders and strips will make a better filling than the blocks, but neither will make as good as gold. As for amalgam, there seems to be a thousand and one manufacturers, each one claiming superiority over all the rest, but with all their progression and superiority, I doubt whether we have a better amalgam to-day, than we had fifteen or twenty years ago. As for cements, there seems to be little or nothing doing in that direction; oxychloride of zinc is the best thing that I know of in the way of cement; it is a very good thing as far as it goes, but falls very far short of what we need. We want a cement of tooth color, that will stand the secretions of the mouth as well as the wear and tear from friction. I know of nothing more needed in operative dentistry at present, than a good cement, that will set quick either under or out of saliva. A cement of tooth color, impervious to the secretions oi the mouth, that will get as hard as a rock in a very short time in or out of saliva, is first what we need for filling teeth. The man that gets up such a cement, will prove to be one of the greatest benefactors that ever got up any thing to fill teeth with. When we look back over the history of cements and see how long and to what extent they have been used for other purposes, it seems strange that we have not been able to get up a better cement for filling teeth than we have. We are told

that rocks or stones have been cemented together centuries ago that are as strong to day where they were cemented as elsewhere. If this is true is it not passing strange that we cannot make a cement that will stop little holes in teeth for ten or twenty years?

A few words upon the subject of exposed pulps or nerves and I will give way to others who may have something more interesting. This is an old and interesting subject, one that has been pregnant with thoughts and actions for a number of years; many ways and means have been resorted to for the purpose of protecting, and preserving this, one of the most delicate, and sensitive organs of the whole organic structure of man. In looking back over the different methods of treatment, and the different things used for covering this little sensitive organ, I find quite a number of things have been used, all resulting in failures to a very great extent.

Up to a few years ago, nothing was known better than Lead, Asbestos, Gutta-percha, Hill's Stopping, Silk, scraped Horn, or Collodion for this purpose. Some six or eight years ago Oxychloride of Zinc was brought forward, and introduced, as being superior to any and every thing used before, and for a short time swept the field as though it had been just the thing we wanted, but I am sorry to say a few years sufficed to prove that it was not all that we needed. At present we have a part composed of the Oxide of Zinc and Creasote which bids fair to supercede every thing that has been gotten up for the purpose of covering exposed pulps. This Oxide Zinc Creasote paste, as it may be called, is made by mixing Oxide of Zinc and Creasote to the consistency of very thick cream, or rather thin butter, when it should be applied to tho exposed pulps, taking care to cover the exposure well, at the same time keeping the paste away from the walls of the cavity as much as possible; as soon as this is done, fill with the Oxychloride of Zinc, as usual; after it sets, cut away as much as need be to make a metallic filling; in so doing, be careful not to cut deep

enough to disturb the nerve covering; it is sometimes best to wait several days before filling with metal, but a majority of those who have been using it the longest, finish their operations the first sitting. This Oxide Zinc Creasote paste, has not been known long enough to be in general use, but a good many have been using it for two or three years with great satisfaction. As I have said before, I have no doubt but this paste will supercede every thing else that has been used for covering exposed pulps. Dr. S. J. King, of Nashville, Tenn., formerly of Petersburgh, Pa., was as far as I know the first man that ever used this paste; as such I must accord to him the credit of not only discovering this valuable remedy for the treatment of exposed pulps, but giving it to the profession.

As Dr. Arthur, our presiding officer, is present, I will call attention to his work on Prevention of Decay, as it comes under the head of Operative Dentistry, not with a spirit of criticism, for I cheerfully endorse the most of his books, but that I wish to have him explain personally his views in regard to the anticipation of decay in such cases as he would operate with an eye single to prevention.

ARTICLE IV.

Virginia Dental Association.—Continued.

THIRD DAY.—Thursday.

The subject of Mechanical Dentistry was resumed, and was discussed by Drs. Shanks, Wayt, Thompson, Sprinkle, Hunt and Smith.

Dr. Thompson thought it very important that dentists should have clean hands, and suggested the use of bicarbonate of soda and soap, when leaving the laboratory for the office.

Fifteen or twenty minutes were consumed in a conversational discussion of obtaining this desirable result.

Dr. Steel said this conversation was not only interesting and instructive, but was, though a small matter, quite an important one. Still we were trenching on the time which should be devoted to the discussion of the next subject in order—viz: That of Operative Dentistry. Before leaving that of Mechanical Dentistry, however, he wished to utter a word of warning, especially to the younger members of the profession. The subject of artificial denture had been so thoroughly ventilated, and reported in the papers so minutely, that attention would naturally be directed to it, and many inquiries made about and requisitions for the new base, and we were in danger of yielding too readily to the demand often made by our patients to extract slightly decayed natural teeth to be substituted for "prettier and more regular" artificial ones. The fight, therefore, for the preservation of the natural teeth would have to be renewed. He had said a thousand times he wished nothing cheaper than gold had ever been known, and could wish that artificial teeth were more expensive, that the inducement to sacrifice the natural teeth for artificial ones would be removed. Beautiful and useful as artificial teeth are, fulfilling as they do more of purposes for which they are designed than any other artificial organ, still he would not give one good, sound, natural tooth for a whole set of artificial ones. He related several cases in which he had by judicious filling saved the natural teeth after they had been condemned; had one case seventeen years standing, in which all but two or three of thirty odd fillings remained good to this day, he having but recently seen his patient, who when but a child, was told by another dentist her teeth could not be saved. His advice was therefore never to *recommend* the extraction of a tooth which could be saved, but if it was a hopeless case, then give your patient the benefit of the highest skill in supplying its loss.

On motion, the subject of Operative Dentistry was taken up and discussed.

Dr. Thackston stated that he would avail himself of the opportunity, while the subject of oxychloride fillings over

the pulps was being discussed, to correct a misapprehension of his views as expressed at a former meeting of the Association. He did not on that occasion say or intend to convey the impression that the death and drying, or "*mummifying*" of dental pulps, sometimes observed after the application of "Guillois' Cement," was either a uniform or even usual result.

Dr. Mercer desired to ask his older brethren their views as to filling the natural teeth apart, and gave an account of what he thought was malpractice in his own mouth.

Dr. Henkel would not have the members think he favored plastic fillings as now in general use, because they were imperfect, and he never put them in with any assurance that they would last more than five days, though they often did last as many years.

Dr. Keesee gave an interesting account of some manipulations with oxychloride and Guillois' cement, and then filling with gold, but had been less successful with approximal cavities than with those on the grinding surface, and asked if the experience of others coincided with his. Dr. Burton had been more successful in these than in other cavities. Dr. Wayt's and Dr. Steel's experience was the same. Dr. Thackston's was that if the filling got wet it failed, if kept dry it would be successful. Dr. Burton used wax to keep the cavity dry. Dr. Thompson passed a heated burnisher over the filling. On motion the further discussion was closed.

The following gentlemen were elected officers for the ensuing year:

President, Dr. W. W. H. Thackston, of Farmville. Vice-Presidents—First, Dr. J. Hall Moore, Richmond; second, Dr. George B. Steel, Richmond; third, Dr. S. H. Henkel, Staunton. Treasurer, Dr. James F. Thompson, Fredericksburg. Secretary, Dr. George F. Keesee, Richmond.

FOURTH DAY.—Friday.

The Association met at the appointed hour, Dr. Thackston in the chair.

On motion, the discussion of "Operative Dentistry" was closed, and a report from the Committee on Dental Literature called for. Dr. Jeter, the chairman, had no written report, but called particular attention to the subject of children's teeth, the importance of which subject he discussed at some length, saying that great ignorance prevailed among the masses, and the people should be informed of their duty on this point.

Dr. Burton thought it so important a matter that he would like to give his views; which he was proceeding to do in an able and interesting manner when the President called attention to the fact that Dental Literature was under consideration, and that this was hardly to the point.

Dr. Burton then said he desired to call attention to Dr. White's treatise on "The Teeth," designed for patients; also to Dr. Garretson's Oral Surgery, and to another work by Dr. Meredith. He regretted that Dental Literatnre had not been of such a nature as to interest the people, hence they do not appreciate our services as they otherwise would. Many of the works were to voluminous. In giving information to our parents we should avoid as far as possible technicalities, using only such terms as are easily understood.

Dr. Moore added his testimony to the little books of Dr. White and Dr. Meredith as just what was wanted, especially as regards the information concerning the six year old molar. Even physicians often seemed ignorant in many instances about them, and frequently advised their extraction, to the detriment of the patient.

Dr. Thompson called attention to the fact that the publication of two dental journals had been commenced since the last meeting, making six periodicals now published. Also, a work on Dental Pathology by a German named Wedl.

Dr. Thackston endorsed what others had said, especially with reference to Dr. Garretson's work. He sincerely wished we had a periodical, which would be indepen-

dent of any department. He exhorted the members to become writers and contributors to the journals. It would improve both writer and reader. We have the talent, and could make liberal contributions on the subjects of Operative Dentistry, Physiology, Pathology, Histology, Therapeutics and Microscopy.

Voluntary essays were next called for. At the reqnest of the President, Dr. Steel read the paper received from Dr. Burkholder on "Atrophy of Teeth." It was heard with interest, and detailed a full and minute account of a most severe case of Atrophy, and was discussed by Drs. Moore, Burton, Wayt, Thackston and Keesee, and the thanks of the Association were tendered Dr. Burkholder.

A communication was read from Mr. Leroy Edwards, President of the Young Men's Christian Association, inviting the members to seats in the Christian Association Convention.

On motion of Dr. Steel, the by-laws were so amended as to make it the duty of the Executive Committee to provide for the entertainment of members attending the annual meetings.

On motion of Dr. Moore, complimentary resolutions and an appropriation of $50 were tendered Dr. Barnum for the donation to the profession of his rubber dam.

On motion, the following committee was appointed to revise the constitution and by-laws, and inquire into the expediency of having the same printed: Drs. Steel, Cowardin, and G. G. Wayt; to which was added the President and Secretary.

The thanks of the Convention and an appropriation of ten dollars were tendered the Young Men's Christian Association for use of hall; also, to Dr. Steel for valuable services rendered; also to the Petersburg, Chesapeake and Ohio, and Atlantic, Mississippi and Ohio Railroads, for reduced fares to delegates; also, to the officers of the Association for the faithful performance of their duties; also, to the newspapers for publishing proceedings.

Dr. George G. Wayt was elected a delegate to the Southern Dental Association, at Memphis; and Drs. Thackston, Moore, Henkel, Steel, Wood, Burton, and H. C. Jones, delegates to the American Dental Association, to meet at Niagara Falls.

The reception of a copy of Dr. Landon B. Edwards' *Virginia Medical Journal* was acknowledged.

Dr. J. S. Michard, was elected an active member of the Association.

Drs. L. M. Cowardin, John Mahony, and George G. Wayt were elected as the Executive Committee for the ensuing year.

On motion, the Association adjourned to meet in Richmond on the Tuesday after the second Monday in December, 1875.

The sessions of the Association were most harmonious, and a great deal of business was transacted, although our reports were somewhat curtailed.

SELECTED ARTICLES.

ARTICLE V.

Amalgams for the Teeth.

BY E. A. BOGUE, M. D.

The physical properties of amalgams are as yet but little understood; and we are glad to know that experiments upon them are now being made, both here and in England, which we trust, will result in valuable additions to our knowledge.

Meanwhile, for information on this subject, we are obliged to rely mainly upon Watts' Chemical Dictionary; and for information concerning amalgams for dental use, we are largely indebted to Messrs. Tomes and Fletcher, of England, and Cutler and Beers, of America.

The alloys for dental amalgam are various. Though mostly compounded of silver and tin, yet gold, platinum, palladium, cadmium, antimony, and copper have been sparingly used.

Some of these metals combine with mercury easily; others with difficulty.

Among the former are silver, gold, tin and cadmium. Among the latter, copper, palladium, and platinum.

It may be well to observe, in passing, that copper combines with mercury by being precipitated upon it; palladium readily, even violently assimilates with it, when in form of a precipitate, though very slowly in any other form; and platinum enters into combination as platinum sponge, or in some alloys, though Dr. Cutler (*Can. Jour. Den. Sc.*, Sept. 1871, p. 324) is not aware that this metal can amalgamate with mercury.

As to the character of these amalgams:

The copper amalgam, which is quite difficult to prepare, is dark in color, and its oxide is poisonous. Though extensively used in Germany, it is fortunately seldom or never employed in this country.

The palladium amalgam is quite as black as the copper, and cannot be used except in the form of a precipitate; but it is not liable to more than superficial oxidatior, and that entirely innoxious.

While most metals combined with mercury are supposed to constitute merely mechanical admixtures or solutions, palladium forms a true chemical union attended by the evolution of heat.

This amalgam is very highly esteemed in certain quarters in England; but its costliness, blackness, and brittleness, however, prevent its being generally adopted.

The amalgams which have been most in favor in this country have been, until within a few years past, composed principally of silver and tin.

Among these, however, are some that exhibit traces of other metals; such as Townsend's and Lawrence's, and perhaps a few others, which contain the copper that enters into the composition of the coin silver they use, and Holmes' which contain a small proportion of gold that is added to diminish the shrinkage.

Recently, through the researches of Messrs. Fletcher and Tomes, a new amalgam alloy has been introduced, which is composed of gold, platinum, silver and tin. The office of the silver is to harden; of the gold, to lessen contraction and oxidation; of the platinum, to hasten the setting and preserve the color. All these are essential points, and more essential in England, perhaps than elsewhere, because an amalgam filling there, as a rule, receives its entire finish at the time of its insertion.

This filling hardens more rapidily than any other which has been in common use; and its contraction is less than that of any other *compound* filling whose contractions have been accurately measured.

As to the shrinkage: It has been thought by some that the action of certain amalgams in the tooth, drawing together and rising toward the centre, was indicative of expansion. But it may be accounted for by the tendency of some metals to assume the form of a spheroid; and the amalgams which harden most slowly are especially inclined to this shape.

Besides, the experiments which have been made upon amalgams by the specific gravity test, have exhibited marked shrinkage.

According to a paper read by Mr. Tomes before the Odontological Society of Great Britain, March 4th, 1872, the variation is from .037 of a unit in the case of palladium to .38 of a unit in the case of tin and silver used in equal parts; the shrinkage amounting to ten times more in the latter case than in the former.

The shrinkage of copper also is very little—scarcely greater than that of palladium.

It has been claimed, however, that the specific gravity test is not sufficiently accurate to measure the shrinkage of these substances; but a mechanical apparatus, constructed for the purpose of testing the very minute expansion and contraction of bodies, furnishes substantially the same results.

We wish now to speak of the practical use of amalgams. It is the general practice to combine the alloy with an excess of mercury; afterwards squeezing out the surplus mercury with the fingers or a pair of pliers.

As it is impossible to get rid of the mercury by this operation, since about twice the necessary quantity remains, leaving the amalgam hard and unworkable, the only proper course is to use the exact proportion necessary to the combination. Should a surplus of mercury at any time be found on the surface of an amalgam filling when the packing is finished, it can be tolerably well absorbed by slices of crystal gold, cut thin with a razor and laid upon the dry surface of the filling, until they are white with the mercury—when they are removed

Dr. Cutler, in his experiments, took twenty-four grains of amalgam, whose composition is not given. and having mixed, pressed, washed, and weighed in the usual way, found that thirteen grains of mercury had been retained. Further on, in the same article, he states that twenty-four grains of coin fillings took up thirty-two grains of mercury·

A red heat for twenty minutes drove off nearly all the mercury, but did not soften the lump, which remained hard and firm, though somewhat brittle. In these cases the proportions are not correct.

Now, if chemically pure silver and tin be combined in atomic proportions, silver 108, tin 118 (*vide* Fletcher on Amalgams—*Brit. Jour.*, 1872, p. 89,) twenty-four grains of the clean filings mixed with seven grains of mercury "will result in a powder, adhesive under pressure which

will not dissolve in alcohol, and therefore needs no washing, and which will weld up as solid as a coin."

"This is a true amalgam, containing no free mercury; in fact, there is great difficulty in separating a trace of mercury below a red heat."

But, of course, it is impossible to use a powder in the majority of cases.

But there is a filling which it is practicable to use in almost all circumstances, viz: the ordinary silver and tin amalgam mentioned above, with the addition of ten per cent. of fine gold and sufficient platinum to insure rapid setting.

If to twelve grains of alloy four or five grains of mercury be added, and the resulting compound be carefully packed, without washing, into the cavity, little by little, with small points, warmed, if necessary, and finished up by repeated burnishing, the result will be a more perfect filling than can be procured by ordinary means, and that, too, with a compound containing little or no free mercury.

From what has been said, it will be seen that the term amalgam has been applied indiscriminately to almost all sorts of compounds; more than two hundred of which have been tested in order to ascertain their physical properties and adaptability to dental purposes.

And it is desirable, in the circumstances, that much more should be known in regard to these compounds, before they be generally adopted or rejected by the profession.—*Dental Miscellany.*

ARTICLE VI.

Treatment of Mucous Polypus of the Velum Palati.

A case is recorded (*Bull Gen. de Therap.*,) of this affection, by Dr. Meplain, of Moulins, in which a young man, 30 years of age, suffered from a small tumour of bright red colour, soft consistence, not pulsating, slightly pedunculated

situated at the junction of the hard and soft palate, a little to the left of the median line. Its duration had been about three weeks, and it had grown rather rapidly from the size of a lentil, when it was first noticed by the patient, to that of a bean, when Dr. Meplain first saw it. It interfered with deglutition and speech, and was liable to frequent hemorrhages after food had been taken. No cause could be assigned for its development. M. Meplain determined to treat it with repeated application of caustic, and for this purpose selected chromic acid, which he painted over its surface four days running. No improvement resulting, he next attempted to remove it with a pair of scissors curved on the flat; the hemorrhage was moderate, and was easily arrested with a compress moistened with perchloride of iron. In three weeks the patient returned with the tumour, which had reached its original size. On this occasion he seized it with a pair of dressing forceps, and endeavoured to tear it away. Moderate bleeding only followed, and this was soon stopped with a little acid gargle. Eight days after the patient again presented himself, and M. Meplain, somewhat discouraged by his failures, recommended him to try frequent application of carbolic acid. This was found to be very difficult, troublesome, and painful but it appeared to check the growth of the tumor. Once more it was removed with the scissors, and once more it returned in the course of a week. Galvano-caustic he had not the means of applying, but he proposed the actual cautery, to which the patient strongly objected. He therefore at length determined to inject with acetic acid. He only threw in one drop with an Anel's syringe, but the effect was most satisfactory. The pain was acute for a short time, but the tumour gradually wasted away and did not return.—*Practitioner.*

ARTICLE VII.

Injury of the Face.

BY J. S. THURNAN, M. D.

I am prompted to report the following case, on account of its rarity in country practice. In Southwest Missouri physicians seldom meet with cases requiring immediate surgical appliances.

I was called in great haste, on the 5th of January last, to see Elois Acock, aged twenty four years. On my arrival I found him lying on the floor in a semi-conscious state, with copious hemorrhage flowing from the mouth and nose. I learned, upon inquiry, that he was passing near the heels of a horse, and slapped it with his hand, at which the animal became frightened, and kicked with all its force, striking patient on the right side of the superior maxillary bone and mouth. I found, upon examination, the upper jaw to be fractured, in a line commencing just behind the last molar tooth, and passing across the malar process to the lateral boundary of the anterior nares, and then down between the canine and incisor teeth. On manipulation of the left side of the upper jaw, I detected mobility and crepitation, but was unable to determine the line of fracture; apparently all the bones of the face were detached and the soft parts terribly contused.

The swelling soon closed his eyes; then he was a horrible looking object. There was a gash cut in the lower lip, I presume by the shoe of the horse, three-fourths of an inch in length. Reaction came on in three or four hours. The hemorrhage was soon controlled by the application of cold water. Several small spicula of detached bone were removed with dressing forceps. The fractured part was then adjusted by introducing my finger into his mouth and placing and holding the detached portion until a cork was placed between the first molars on each side, and the lower jaw brought firmly up, which held the cork in its place; a

bandage was then applied, such as is used in fracture of the inferior maxillary. The gash in the lip had previously been united with sutures; the other bones were replaced as far as possible. Patient was then placed in bed, the mouth and nose ordered washed with solution of carbolic acid four times per day, and fluid nourishment. The first twenty-four hours patient was very restless, after which he became more quiet and rested well. I removed the bandage on the 14th day, and found union perfect. Some discharge from the nose. Continued carbolic acid solution to the nose. Four weeks after, I saw the patient at my office; there was no discharge from the nose and he said he was satisfied with his jaw, but should have been glad of a few more teeth.—*Medical and Surgical Reporter.*

ARTICLE VIII.

Resection of the Upper Jaw, with Preservation of the Muco-periosteal Covering of the Hard Palate and Incisor Teeth.

In the *Berliner Klinische Wochenschrift* for Nov. 3d, 1873, is reported a case in the clinic of Profeesor Linhart, in which he performed the above operation for the second time. The patient was a married woman, aged thirty-three. She went into a lucifer-match manufactory at the age of twelve, and, about a year afterwards, she seems to have become affected with match-makers' disease. On admission into the Royal Julius Hospital in May, 1873, her condition was as follows: There was an abscess in the lachrymal sac on the left side; and on examining the mouth, it was found that all the teeth of the upper jaw with the exception of the two last molars of the left side were loose and nearly falling out. Only the two incisors of the right side and the first of the left side were firm. The teeth of the lower jaw were complete and sound; a tooth had been extracted from the upper jaw some time previously (the carious tooth,

which had been the means of the introduction of the disease,) and at this spot were two sinues, which discharged a thin, copious, and very fetid pus. A probe, which could be easily passed, detected dead bone. The gums and mucous membrane of the mouth were pale and inclined to bleed. The disease was diagnosed as phosphorous necrosis of both upper maxillæ. On May 18, Dr. Linhart performed the following operation: Chloroform having been administered the loose teeth, with the exception of the incisors and two last molars of the left side, were first removed. An incision was next made from between the eyebrows, perpendicularly downwards over the bridge of the nose, through the middle of the septum, and upper lip. The incision was carried as deep as possible, and the soft parts, with the periosteum of the upper jaw, on each side, were stripped off and reflected as far as the zygoma. Next an incision was made on the left side with an osteotome, in an oblique direction downwards from the apertura pyriformis, about half an inch below the infra-orbital margin, as far as the second molar tooth. On the right side the disease had spread wider; and the nasal process being divided, the osteotome was carried close under, and parallel with the infra orbital margin, as far as the greater wing of the sphenoid. The gum, with the three contained incisors and muco-periosteal covering of the hard palate, was now stripped off and turned down. The detached flap lay on the tongue, and served to conduct the blood out of the mouth and to prevent its going down the larynx. The bones were separated from their attachments and removed. The muco-periosteal covering of the hard palate was first fastened, and then the cheek-flaps brought together over the bridge of the nose. Following Bardeleben's method, the covering of the hard palate was joined within to the partially detached mucous membrane of the cheek; an armed needle was passed through its free edge, and out through the cheek on each side, and tied over a quilled suture. The external wound was brought together by twisted sutures and hare-lip pins. On the third day all

the stitches were taken out, with the exception of those in the palate. The edges of the wound united by first intention, and the pus flowed out between the front opening of the newly formed palate and the upper lip. On the seventh day the sutures in the palate were removed, and it was found that the covering of the hard palate was completely united. It formed a concave bridge, which supported itself.

The three front teeth were not quite firmly set, but could be pressed level. This was effected by placing a piece of cork in the mouth. The gaps soon filled in with granulations, and the muco-periosteal flap and the teeth became rapidly firmer. On her discharge from the hospital on July 12, she could eat and drink, and spoke in a firm voice scarcely at all nasal.

[The great interest of the foregoing case is the preservation of the teeth; the operation of removal of both bones, either partial or entire, having been frequently performed in cases of phosphorus necrosis.]—*London Med. Record.*

EDITORIAL, ETC.

Practice of Dentistry in the State of South Carolina.—AN ACT to Regulate the Practice of Dentistry and protect the people against Empiricism, in relation thereto, in the State of South Carolina.

Be it enacted by the Senate and House of Representatives of the State of South Carolina, now met and sitting in General Assembly, and by the authority of the same: SECTION 1. That from and after the passage of this Act, it shall be unlawful for any

person or persons to engage in the practice of dentistry in the State of South Carolina, unless said person or persons shall receive a diploma from the faculty of some dental college, duly incorporated under the laws of this or some other State of the United States, or foreign Government, in which is annually delivered in good faith, a full course of lectures and instructions in dentistry, or shall have obtained a license from a Board of Dentists, duly authorized and appointed by this Act to issue such license.

SEC. 2. It shall be the duty of the South Carolina State Dental Association, at the next annual meeting thereof after the passage of this Act, to elect a Board of Examiners, to consist of five members, to be known by the title of the Board of Dental Examiners in the State of South Carolina. The members of this Board shall, at the first election, be elected for terms of one, two, three, four and five years, respectively, or until their successors shall have been elected. And it shall be the duty of the South Carolina State Dental Association, at each subsequent annual meeting thereof, to elect a person for the term of five years to fill the place of the member of the Board whose term of office shall at that time expire, and also to fill such vacancies in the Board as may have occurred during the year. And if at any regular meeting of the Board, any member or members shall fail to be present, the South Carolina State Dental Association may, at its discretion, declare the office of such absentees to be vacated, and may proceed to elect a new member or members for the unexpired term of such person or persons, or it may elect a member or members to fill temporarily the place or places of such absentees. This Board shall be organized by the election of a President and Secretary.

SEC. 3. It shall be the duty of the Board of Examiners to meet annually at the time and place of meeting of the South Carolina State Dental Association, giving thirty days' notice in the public newspapers published in not less than three different places in the State, viz: One in Charleston, one in Columbia and one in Greenville, of such annual meeting. Secondly, to prescribe a course of reading for those who study dentistry under private instructions. Thirdly, to grant a license to any applicant who shall furnish satisfactory evidence of having

graduated, and received a diploma from any incorporated dental college in good standing with the profession, without fee, charge or examination. Fourthly, to grant license to all applicants who undergo a satisfactory examination. Fifthly, to keep a book in which shall be registered all persons licensed to practice dentistry in the State of South Carolina. The expenses of said license shall be fifteen dollars, to be paid by the licensee. And that all persons who do now hold, or may hereafter hold, a license to practice dentistry in this State, shall become a member of the South Carolina State Dental Association immediately upon obtaining said license; *Provided*, He shall be allowed to waive his right of membership.

SEC. 4. That the books so kept shall be a book of record, and a transcript from it, certified by the officer who has it in keeping with the common seal, shall be evidence in any Court of the State.

SEC. 5. That three members of said Board shall constitute a quorum for the transaction of business, and should a quorum not be present on the day appointed for their meeting, those present may adjourn from day to day until a quorum is present.

SEC. 6. That one member of said Board may grant a license to an applicant to practice until the next regular meeting of the Board, when he shall report the fact, at which time the temporary license shall not be granted by a member of the Board after the Board has rejected the applicant.

SEC. 7. That every dentist in this State be required to keep a record of all cases treated in his practice, in accordance with a form to be designated by the South Carolina State Dental Association, and furnish his patient with a copy of the same, if so desired, by the patient.

SEC. 8. That any person who shall, in violation of this Act, practice dentistry in the State of South Carolina for fee or reward, shall be liable to indictment, and on conviction shall be fined not less than fifty or more than three hundred dollars: *Provided*, That nothing in this Act shall be so construed as to prevent any person from extracting teeth.

SEC. 9. That on trial of such indictment, it shall be incumbent on the defendant to show that he has authority under the law to practice dentistry, to exempt himself from such penalty.

SEC. 10. That all fines collected shall inure to the educational fund of the County where the offender resides.

SEC. 11. That those who have been in the regular practice of dentistry in the State prior to the passage of this Act are exempt from the provisions of the same, except Section 7 of this Act.

SEC. 12. That the South Carolina State Dental Association is hereby made a body politic, and corporate, shall have and use a common seal, sue and be sued, plead and be impleaded, and be empowered to make all necessary by-laws not inconsistent with the State laws and Constitution.

SEC. 13. That all Acts or parts of Acts inconsistent with this Act be, and the same are hereby, repealed.

The above Act has received the Signature of the Governor, and is now a law of the State.

MONTHLY SUMMARY.

An Unnatural Position of the Head a Cause of Death from Anæsthetics.—An interesting paper by Dr. G. W. Copeland appeared some time ago (Feb. 26, 1874), in the *Boston Medical and Surgical Journal*, on the "*Styloid Muscles and Anæsthetics.*" In this article the cause of impeded breathing during anæsthesia was attrbuted to the action of the styloid muscles closing the glottis. It was also there shown that the difficulty could always be relieved by simply tilting the head forward so as to relax these muscles, without making traction on the tongue. In a further contribution by the same writer the *Philadelphia Medical Times* of May 30, it is claimed that death from chloroform and other anæsthetics is often caused by an unnatural position of the head, the latter being thrown back and the styloid muscles put upon the stretch. Circumstances in a number of recorded cases of death from anæsthetics are cited which favor this opinion. It is asserted "that all the deaths from nitrous oxi de gas, and a large number of those from other

anæsthetics, have taken place while the patients were in a sitting posture, which would allow the head to fall back farther than if they were lying down; thus favoring the theory that interference with the free action of the lungs may have been the primary cause of death." The cardiac syncope would be of course more readily induced "in patients suffering from shock or fatty degeneration, or already reduced by disease."

Another point advanced is "the importance of elevating the head sufficiently to compel the patient to inhale the anæsthetic through the nares entirely. If deep inspirations be taken through the open mouth, the lungs are inflated instantaneously, and just as rapidly emptied leaving a long interval while no vapor is in the lungs. If the inhalations be through the nerves, it takes a much longer time to inflate the lungs, and a much longer time to empty them, leaving no interval. Now the number of respirations per minute is the same either way; hence it follows that it will require a longer time to effect anæsthesia through the mouth than through the nose."

Manufacture of Caoutchouc from Milk-weed.—The *Canadian Pharmaceutical Journal* states that a company, having an authorized capital of $100,000, has recently been formed for the above purpose at London, Ont. In one experiment, one thousand pounds of milk-weed were operated on, and it was found to yield four per cent. of caoutchouc. The process consisted in subjecting the plant to partial decomposition, heating by steam, and then treating by maceration with coal-tar naphtha. The benzine, holding the caoutchouc in solution, was then distilled, when the rubber was finally obtained in a solid form.

A New Operation for Cleft Palate.—In a recent number of the *The Record* we noticed a modification of an operation for fissure of the bony palate, performed by Sir Wm. Fergusson (and described in *The Lancet*, vol. ii. p. 784), after the failure of the ordinary operation of Langenback. *The Lancet* of June 20, 1874, contains a description of still another improvement by the same surgeon. The operation, as before described, consists in paring the edges of the mucous membrane on each side of the cleft, and then, by means of a chisel, splitting the hard palate on each side, and forcing the two portions of bone thus obtained towards the middle line. The osseous fragments are then bound together in the middle line by two or three silk ligatures, each of which passes through the nasal cavity. The results of all the cases operated upon up to that date were reported at page 298 of the current volume. Although the operation has hitherto

been remarkably successful, considering the severity of some of the cases in which it has been employed, it had one drawback. The two bony fragments were liable to become tilted. To obviate this Sir William recently followed this course:—After paring the edges of the mucous membrane, he pierced the hard palate with an ordinary shoemaker's awl in two places on each side of the cleft, close to the margin, in such a manner that the holes on one side of the fissure were directly opposite those on the other side. A seperate silk suture was then passed through each hole on one side, carried into the nasal cavity, and brought into the mouth again through the holes on the opposite side of the cleft. When the sutures where thus secured, the hard palate was divided on each side outside the apertures, by means of the chisel, in the manner described. The silk sutures were then drawn together, and the two fragments of bone brought into gentle apposition. Sir William remarks that since first performing this operation he has found that it had been previously recommended by Dieffenbach —*Med. Record.*

Electric Light.—A wild machine, intended for the production of light for light houses, gave a light of such intensity, that, when put upon a lofty building, it cast shadows from the flames of the street lamps a quarter of a mile distant upon the neighboring walls. The same light, at two feet from the reflector, darkened senstized photographic paper as much in twenty seconds as the direct rays of the sun at noon on a clear day in March in one minute.—*Popular Science Monthly.*

Chloral Hydrate and Camphor as a Local Application in Neuralgia—It is said that the intimate mixture of equal parts of chloral hydrate and camphor will produce a clear fluid which is of the greatest value as a local application in neuralgia. Mr. Lenox Browne states, in the *British Medical Journal*, that he has employed it, and induced professional friends to do so, and that in every case it afforded great, and in some instantaneous, relief. "Its success does not appear," he says, "to be at all dependent on the nerve affected, it being equally efficacious in neuralgia of the sciatica as of the trigeminus. I have found it of the greatest service in neuralgia of the larynx, and in relieving spasmodic cough of a nervous or hysterical character." It is only necessary to paint the mixture lightly over the painful part, and to allow it to dry. It never blisters, though it may occasion a tingling sensation of the skin. He has found it also an excellent application for toothache.—[We have used this remedy in several cases of neuralgia of the trigeminus, but with no good result.]—*Med. Record.*

An Extraordinary Case.—An extraordinary case was recently brought before the Dublin Pathological Faculty by Professor R. W. Smith, of Dublin University. The disease under which the woman succumbed, whose skeleton he exhibited, was one of rare occurrence, and difficult alike to diagnose, treat, or even name. At the time of her death the woman was forty-five years old. Fifteen years previously she had been sent to jail for some offence, which was probably committed while insane, as shortly afterward she was transferred to a lunatic asylum. During the first ten years of her residence there nothing remarkable about her was noticed, and she was employed in washing the floors, etc. At the end of this period she ceased to be able to work, and remained in bed for the remaining five years of her life, gradually becoming more feeble, and dwindling away in stature until she became about one-half of the height she was originally. She did not complain of any pain; her limbs became coiled up in every possible shape, and she seemed gradually to disappear from off the face of the earth. She died, possibly, from constitutional disease of the osseous system. He (Professor Smith,) however, looked upon the condition of the bones not as a disease, but as a manifestation of an as yet unknown diseased condition. Professor Smith had weighed all the bones individually; the total weight of the skeleton (including the cranium) was two and one half pounds, which equalled about the fourth part of the weight of a child at birth. The bones were extremely light, soft, fragline, and atrophied in every respect. The number of fractures were prodigious. The ribs were in a hundred fragments. The head of the humerus was bent; the fibulæ were curved; the thigh-bones and pelvis were huddled up together; and the bones of the vertebræ thinned and worn away across the front of their bodies. The lower jaw was atrophied and broken into three fragments; the base of the skull was cribriform all through; and he (Professor Smith) believed that if the woman had lived longer not a vestige of a bone in her body would have been left. As to the nature of this disease he (Professor Smith) believed that it was identical with rickets occurring in the adult; and although that opinion might appear heretical to some, yet he was glad to find that in the last volume of Trousseau's Lectures on Clinical Medicine, that distinguished author had expressed his opinion that osteomalacia and rickets were one and the same disease.—*Irish Hospital Gazette.*

Fine Wire.—Gold and Platinum have been drawn to a "spider line" for the field of a telescope, by coating the metal with silver, drawing it to the finest number, and then removing the silver coating by acid, leaving the almost imperceptible interior wire, which, in a neat experiment in London, was so attracted that a mile's length only weighed a grain.

Acidity of the Gastric Juice.—At a meeting of the Biological Society of Paris, MM. Claude Bernard and Lepine both asserted that the results of their recent experiments led them to reaffirm that, contrary to the statements of some German authors, the glands of the stomach do not secrete an acid juice, and that it is only on the surface of the mucous membrane that gastric juice becomes acid.

Lymphatic Tumors of the Face—Dr. Leoni describes a remarkable sort of affection that occurred in his own person, and the nature of which he can only suspect. One day his right upper lip commenced to swell until it became a tumor of considerable size. He could assign no cause for it, for he had received no injury there, nor had there been previous trouble of any kind. The swelling was not painful, but gave the sensation of great tension, as if it was in a state of erection. At the end of two hours it had disappeared as suddenly as it came. Subsequently, similar swellings occurred on two occasions, once in the same place, and once in the lower lip and chin, lasting in this last case from three to four hours. He tried in vain to reduce them by pressure and manipulation, and finally introduced an exploring needle through the mucous membrane of the mouth, thinking to evacuate the contents, if they were fluid. Nothing, however, escaped. Leoni thought there was no evidence to show that the tumors contained blood. It seemed more likely that they were lymphatic in character, and produced by some obstruction in the course of lymphatic vessels.

We had observed the same affection, in a less degree, in a young woman, at the commencement of her menstrual epoch.—*Nord. Med. Ark.—Nashville Jour. Med. and Surg.*

Actual Cautery.—When actual cautery is to be used the iron must be heated till it is really of a white heat, and looks almost as white as white paper. If then applied it destroys the part instantaneously, giving no pain ; but it must be removed quickly on the heat decreasing. if and only red hot the agency is intense. The first time I saw the cautery used, on a girl of 14 years, no pain was given ; the second time, on an elderly person [both for fungus of the upper maxillary bone,] the screeching was fearful, till I told the operator his irons were not half hot enough. He requested me to heat them properly, which being done, not a murmur was heard. The last time I saw it, and was opening four or five sinnures in a horse's shoulder. He never flinched, and seemed scarcely aware of what was being done. I would suggest using to obtain the white heat for actual cautery, a large splint blow pipe.—Dr. J. S. Camden.—*Medical Times and Gazette.*

Headache from Eye-Strain.—It is well known that headache is a symptom of many intra-occular disorders, but neither in the works on the eye, says Dr. S. Weir Mitchell, nor elsewhere, is it made plain that headache may be for years almost the sole symptom of grave disorders of accommodation or of defects in the orderly action of the external eye muscles. Dr. Mitchell has often seen the sequence, and in cases of chronic headache, insists upon a careful examination of the eye, and has often been rewarded by finding the pain fade away when the optical effect has been duly corrected. The strain caused by the various forms of astigmatism often causes headache; but a light insufficiency of some one of the extra-ocular ball muscles is far more likely to give rise to it. In all of them the headache comes by degrees, and is at first found only following long use of the eyes. By and by, almost any use of the eye causes pain. The over-effort made to correct or accommodated, and converge or diverge the eyes, at first causes pain only on such effort; but at last the teased brain gets to aching when the patient is not trying the eyes, when he is thinking or doing a little mental arithmetic, or the like. Facts like these have often made physicians overlook the eye trouble as the true parent of the pain. When once the intra-ocular or oculo-motor trouble has been relieved, it seems natural to suppose that the headache would at once disappear, but, in fact, it fades away but slowly, and sudden entire relief is rare.—*Med. and Surg. Rep.*

Assaying by the Spectroscope.—A paper with the above title has been issued by Mr. Outerbridge, detailing a series of experiments made at the U. S. Mint, in Philadelphia, with a view of ascertaining the possibility of determining the value of metals by the spectroscope. The conclusion arrived at, is that

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assaying by this means is impracticable.

Tenotomy in the Treatment of Fracture of the Lower Jaw.—A machinist came under the treatment of Estlander, having sustained a double fracture of the lower jaw from a heavy blow, the lines of fracture on either side passing through the mental foramen. The separated portion of bone was drawn strongly backwards and downwards, and could only be replaced by using considerable force, but it was found impossible to retain it in place, though many different kinds of apparatus were tried. To overcome the difficulty, Estlander divided the tendons of the genio-glossus, genio-hyoid and digastric muscles, after which there was no difficulty in replacing the fragment and keeping it in place. Neither the tongue nor hyoid bone were materially affected, and the patient made a good recovery. —*Nord. Med. Arkiv.*

Causes of Death from Petroleum Explosion.—The *Lancet* expresses the opinion that oftentimes, in fatal explosions of petroleum, death is produced instantaneously by shock, combustion and anæsthesia. Petroleum is a mixture of homologues belonging to the marsh gas family, which for many years have been recognized as powerful anæsthetics. Some 15 years ago an attempt was made to introduce one of them, the hydroïd of amyl, as a substitute for chloroform.

Hydrogen Alloys.—Mr. Dumas has communicated to the French Academy some experiments on the hyeratus of mercury or combinations of hydrogen with that metal. These combinations, it is said, so strongly resemble those which constitutes the amalgams of mercury with silver and other white metals, that it is hardly possible to doubt that they are themselves amalgams, and hence that hydrogen is a metal, a fact affrontly indicated by many other amalgams.

Lacto-phosphate of Lime for Carious Teeth.—Lactic acid and phosphate of lime, mixed into a paste at the time of using, the Cincinnati *Dental Register* commends highly for filling the cavities of teeth. It becomes hard in a short time, and assimilates itself to the tooth, or at least adheres to it closely and protects the nerve-pulp. The Editor of the *Register* is sanguine in regard to its advantages.

Difference in the Composition of Teeth, etc.—It was stated at the meeting of the American Dental Society of Europe held at Geneva, in Italy, that in Berlin generally, teeth lacked phosphate of lime. The soil lacked it and even hen's eggs have soft shells. In Norway and Sweden the teeth are more dense and less liable to disease. The teeth in England and America are generall better, denser, harder, and have more resisting power to disease than the teeth in Europe generally. In Berlin soft chalky teeth are almost the rule. Loosening and loss of teeth from tartar abound in an extraordinary degree in Lyons. Chloral hydrate used as a dentrifice is very injurious to the gums. In Zurich the teeth of the working people are worse than those of the higher classes. This is ascribed to the food which consists of bread and poor wine. The people of Egypt and Palestine have good teeth and but little toothache. The Romans have goad teeth, which is attributed to the abundance of lime in the water. In the mountains of Berne, where bread, milk and cheese are the staple foods, the teeth are good and free from tartar. In the valleys the reverse holds good. Children in choccolate manufactories have carious teeth.

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